

The National Institute of Standards and Technology (NIST) developed a standard for the measurement of air-kerma strength from encapsulated brachytherapy sources of ^{125}I in 1984, based on the use of a conventional, parallel-plate (Ritz) free-air chamber. A Wide-Angle-Free-Air Chamber (WAFAC) has recently been developed as the new primary standard for photons emitted with energies up to about 35 keV from such sources. The WAFAC has important advantages over the Ritz chamber: it accepts a solid angle ~ 65 times larger, its active volume is larger by a factor of ~ 130 , and its ratio of collecting/active volumes is close to 2 rather than ~ 80 which results in a much improved signal-to-leakage ratio. Its inherent advantages facilitate the determination of air-kerma strength for seeds of new design intended for clinical use, and the transfer of these measurements to the AAPM Accredited Dosimetry Calibration Laboratories. Moreover, the WAFAC provides an air-kerma-strength standard for ^{103}Pd seeds, for which there has been no previous standard. The talk will outline the WAFAC design and the measurement methods used for the new standard, the correction factors applied in the measurements, and the uncertainties associated with the results. In contrast to the old standard, the new primary standard effectively eliminates the effects of the characteristic x rays produced as secondary fluorescence in the titanium cladding of these seeds. This action results in a significant change in the reported air-kerma-strength, a change that will have to be incorporated into treatment protocols to maintain delivered dose.