

X-ray measuring instruments are calibrated at the National Institute of Standards and Technology (NIST) in terms of air kerma or exposure in highly characterized x-ray beams. The beam qualities offered for calibrations have changed several times since their origin in the 1950's. The two new high-resolution, high-output x-ray systems with constant potential generators allowed the development of the beam qualities outlined by the International Standards Organization (ISO). These 41 ISO beam qualities are available in addition to the previously existing NIST beam qualities, resulting in a better coverage of the radiation protection and radiation therapy exposure range. Some changes have been made to the low-energy beam qualities used for calibrations representing skin therapy exposures. Two beams have been added to the radiation therapy NIST M-series, the M80 and the M120, developed at 80 and 120 kV. The M80 and M120 beam qualities represent the most commonly used beams in diagnostic radiology. Their development has been requested by the AAPM-Accredited Dosimetry Calibration Laboratories (ADCL) for at least the last five years to allow proficiency testing among the ADCLs. In the past, the ADCLs have had to interpolate between beam qualities offered at 60, 100 and 150 kV for the calibrations they offer for the M80 and M120 beams, resulting in non-NIST traceable calibrations. Several ionization chambers have been calibrated to the new M80 and M120 beams and the responses analyzed in comparison to interpolated calibration factors.