

AbstractID: 6597 Title: X-ray Constant Potential W(Re) Target Derived from a Data Base of Measured and Calculated Spectra Using kVp and Aluminum Transmission Measurements

Calculated CP x-ray spectra, W(Re) target, derived from measured values by Birch et al were coded into a data base. Spectra ranged from 30 to 140 kVp with different inherent Al, 0.5 to 4.0 mm, filtration values. Thirty six spectra, 17 degree target angle, were used for the data base. Spectra were normalized to 0.5 mm Al inherent filter to obtain composite curves, mR/Mas vs kVp and photons per mm^2 per mAs, at 75 cm distance and x-ray energy and exposure spectra, photons per keV per mm^2 per mAs and R per keV per mAs, at 75 cm. Derived spectra at 10 kVp intervals are used to form other spectra by interpolation.. Spectra are then used to form a computer generated transmission curve. Measured transmission curves with an unknown amount of inherent filter Al equivalent and target angle are matched to the computer curves. The process produces a computer generated curve for an optimum kVp and inherent filtration in mm Al that match the measured transmission curve to some arbitrary fit criteria across a variable range of Al filter thickness. Errors include use of different attenuation and absorption coefficients by Birch et al and ourselves, the use of pure Al or alloy 1100, transmission measurement errors and uncertainty in the nominal mAs and kVp. Differences in target angle show up primarily as differences in apparent inherent filtration. Spectra derivation from measured transmission values will be presented. The program that performs this process will be given to interested persons.