

A Retrospective Analysis of Electron Cutout Factor Measurements

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In the past three years, over 300 electron beam cutouts had been used clinically at West Virginia University Hospitals. These cutouts were made of cerrobend and fitted onto the electron applicators of our Siemens accelerators. The electron beam energies used ranged from 6 to 21 MeV. This paper presents a retrospective analysis of the types of electron cutouts used and the measured cutout factors. Included in the analysis are the SSD, energy and shape of the cutout. The electron cutout factor is found to vary from 0.96 to 1.02 for all electron beam energies. The variation depended on the cutout size and the energy of the electron beam. Typical SSD ranged from 100 to 103 cm. Extended SSD 5 cm beyond the nominal distance is seldom used. The size of the cutout strongly influenced the electron beam cutout factor. These results have further allowed us to estimate factors of arbitrarily shaped cutouts. To gain some understanding of these SSD, energy, and cutout shape effects, measurements were made for a few clinically shaped cutouts. These measurements, including depth dose and cutout factors will be discussed in the light of the existing literature.