

AbstractID: 13142 Title: Re-evaluation of a tungsten made commercial eye shield in electron beams

Purpose: To re-evaluate the transmission factor for a tungsten made commercial eye shield in electron beams based on the dose to the periphery of lens. **Method and Materials:** Kodak EDR2 film and MOSFET detector was used to measure the transmission factors of the tungsten internal eye shields in 6 and 9 MeV electron beams. The thickness of the tungsten is 3 mm with a 0.5 mm and a 1 mm thick aluminum caps provided to reduce backscatter to the eyelid. The doses to the periphery of lens were measured at 5 mm depth below the eye shields and 5 mm away from the central axis. The doses were then normalized to the dose to dmax under the same setup without eye shields to come up with the transmission factors. Comparatively the transmission factors referred by the manufacturer were determined with the lens dose measured along central axis. **Results:** The transmission factors for 3 mm tungsten, and 3 mm tungsten with 0.5 mm and 1 mm aluminum caps in a 6 MeV electron beam are 3.8%, 5.2% and 6.5%, respectively, based on film measurement, and 3.2%, 5.1% and 5.9%, respectively, based on MOSFET measurement. Those in a 9 MeV electron beam are 3.8%, 5.0% and 5.3%, respectively, based on film measurement, and 4.5%, 4.9% and 5.3%, respectively, based on MOSFET measurement. The transmission factors referred by the manufacturer are 2.5%, 2.4%, 2.5%, respectively, for a 6MeV beam, and 3.3%, 2.9%, 2.8%, respectively, for a 9 MeV beam. **Conclusion:** The re-evaluated transmission factors are significantly larger than those referred by the manufacturer. Aluminum caps can increase significantly the dose to the peripheral region of shielded area due to their scattering contribution. **Conflict of Interest:** No.