

Evaluation of Attenuation Properties of Some Common and Special Building Materials

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This work has as objective the evaluation of attenuation properties of some common building materials like holey clay brick, massive clay brick, perforated concrete block and others and special building materials as barite based materials, when submitted to X-rays photons. A more appropriate and economic shielding barriers will be obtained using a calculation method based on a semi-empirical model and an analytic function that allows the determination of attenuation curves. Attenuation properties of these materials were measured using a constant potential (Phillips MGC 40) and a three-phase (Siemens Gigantus based system) X-ray generators and ionization chambers. These equipments provided informations regarding the attenuation properties of the studied materials in a range of 30 to 300 kV. Several situations were simulated according to their applications, diagnostic or therapeutic modality, room layout and material used to accomplish the protection. A computational program uses these data and the attenuation curves, in order to provide different combinations of protection materialsto achieve a better performance with lower cost. The obtained informations provide convenient data to follow national and international recommendations regarding radiation protection optimization.

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