

Title (en)

COMPTON BACKSCATTER PIPE WALL THICKNESS GAUGE EMPLOYING FOCUSING COLLIMATOR AND ANNULAR DETECTOR

Title (de)

COMPTON-RÜCKSTREUUNGS-WANDDICKENMESSER MIT FOKUSSIERKOLLIMATOR UND RINGFÖRMIGEM DETEKTOR

Title (fr)

JAUGE D'EPAISSEUR DE PAROI DE TUYAU A RETRODIFFUSION COMPTON EMPLOYANT UN COLLIMATEUR A CONCENTRATION ET UN DETECTEUR ANNULAIRE

Publication

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Application

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Abstract (en)

[origin: WO9733141A1] This invention is directed toward the measure of the thickness of material using nuclear techniques. More particularly, the invention is directed toward apparatus and methods for measuring the thickness of pipe wall, from the outside of the pipe (70), using an annular detector (50), concentric conical detector collimation (26), and backscatter gamma radiation. A source of gamma radiation (14), preferably at energy 279 keV from mercury-203, is collimated into a pencil beam and impinged perpendicularly upon the outside of the pipe wall to be measured. Compton backscatter radiation from the pipe wall is then measured with an annular, concentric photon detector which preferably comprises a scintillation crystal, such as sodium iodide, optically coupled to a single photomultiplier tube. Pipe thickness is determined from detector response using a predetermined relationship obtained during system calibration. Conical, concentric detector collimation is used to obtain accurate and precise measurements when the pipe is filled with liquid.

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