

1.4.41. MULTI-ELECTRODE HETEROGENEOUS IONIZATION CHAMBERS FOR X-RAY THICKNESS MEASUREMENTS

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X-Ray thickness measuring is applied widely in an iron and steel industry. For today, the main problem arising during creation X-Ray thickness gauges is the necessity in rigid stabilization of probing radiation flux by both spectrum and intensity. At the same time, it is important to narrow the spectral distribution of flux power.

Use of radiation sources of microtronic type in the structure of thickness gauges is problematic in connection with their high cost and overall dimensions. Therefore, X-Ray tubes with highly stabilized constant voltage sources used as their power supply are applied mostly wide. The problem consists in that it is not possible to obtain the consistency of radiation flux for a long period of time (during a day or more) even with power supply of X-Ray tube from absolutely stable source. It is because the geometry of X-Ray tube electrodes vary under action of temperature and, when they are used in production conditions of rolling mills, under action of vibration and shock loadings. Variation of electron beam focusing inside the tube for the account of re-distribution of static charge on the dielectric elements of structure also contributes long-term instability of radiation parameters. Effective radiation energy is varied also by target material evaporation with the subsequent depositing of heavy metal (tungsten, as a rule) atoms on the glass or beryllium exit window of radiation.