

# RADIOACTIVITY MEASUREMENTS AND ASSESSMENT OF THE HEALTH RISK OF CERAMIC TILES PRODUCED IN SERBIA

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**Abstract:** *This paper presents the results of gamma spectrometry measurements of natural radionuclides ( $^{226}\text{Ra}$ ,  $^{232}\text{Th}$  and  $^{40}\text{K}$ ) in some floor and wall ceramic tiles produced in Serbia and used in homes and business premises. The measured mean value of the activity concentration of  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$ , and  $^{40}\text{K}$  exceed the average values in the world for building materials with values of  $67.2 \pm 6.9 \text{ Bq kg}^{-1}$  for  $^{226}\text{Ra}$ ,  $57.4 \pm 4.7 \text{ Bq kg}^{-1}$  for  $^{232}\text{Th}$  and  $808 \pm 48 \text{ Bq kg}^{-1}$  for  $^{40}\text{K}$ . Based on these calculated values, the representative level index – gamma index ( $I_\gamma$ ), associated with gamma radiation, whose average value is  $0.78 \pm 0.06$  and annual effective dose ( $D_e$ ), whose average value is  $0.117 \pm 0.009 \text{ mSv y}^{-1}$  for homes and  $0.034 \pm 0.002 \text{ mSv y}^{-1}$  for business premises were obtained. Estimated values fulfill all the recommendations of the European Commission for building materials, thus analyzed materials are considered not to be a health hazard for the public.*

**Keywords:** *ceramic tiles, gamma spectrometry, health risk, gamma indices, annual effective doses.*