

Use of indexes for building materials containing NORM residues and radon issue

Cristina Nuccetelli¹, Federica Leonardi², Rosabianca Trevisi²

¹ *Istituto Superiore di Sanità (National Institute of Health), Viale Regina Elena 299, 00161 Rome, Italy*

² *INAIL Ricerca (INAIL Research Sector), Via Fontana Candida 1, I-00040 Monteporzio Catone (Rome), Italy*

Telephone: +390649902732, fax: +390649902137 e-mail: cristina.nuccetelli@iss.it

Abstract

The role of building materials as source of gamma radiation has been recognized in the new EU Basic Safety Standards. In this Directive, an index to screen building materials of radiological concern is introduced. This index was developed to account for average concrete values of thickness and density, which are the main structural characteristics of building material affecting the gamma irradiation. Consequently, this screening procedure could unfit in case of significantly different density and/or thickness of the building materials under examination. In this paper a more accurate and flexible activity concentration index, accounting for actual density and thickness of building materials is proposed. This index $I(\rho d)$ with its mathematical structure accounting for density ρ and thickness d of the building material, is proposed as a screening tool able to identify building materials of radiological concern in a more realistic way compared with the EU BSS index. Indeed, the use of $I(\rho d)$, while remaining conservative, can reduce the amount of needed deeper assessments resulting from the application of very conservative screening tools, e.g. EU BSS index used on bricks. Finally, some proposals to face the problem of screening of building materials accounting for the relevant radon are presented.