The milling of zircon, workers' exposure levels and exposure mitigation measures used in the zircon industry

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Abstract

The Zircon Industry Association (ZIA) is an independent, industry association for the entire zirconium value chain; from zircon sand produced by mining, to wide range of downstream products, including zircon flour, opacifiers, refractory materials, fused zirconias and zirconium chemicals. ZIA has as its principal objective, the promotion of the benefits and uses of zircon and its derivatives as high quality, value-adding materials in a wide range of applications through product support, innovation, and research and market development.

As zircon is a naturally-occurring radioactive material (NORM), appropriate measures are used to minimise exposure of workers during the manufacture of various downstream products, particularly in higher risk areas where inhalable dust may be created. The dry milling of zircon to fine-grained flour and associated handling of such fine particles (95% 45µ or 95% 5µ) warrants a high degree of control.

During 2016 the ZIA conducted a survey of EU-based zircon millers to highlight the various milling techniques used along with associated exposure data at various key steps in the process (bulk storage, grinding/milling and bagging of the flour).

The presentation briefly outlines the ZIA and goes on to review the measured radiation exposure data at the different milling operations, comparing these data with theoretical doses as well as those occupational exposure limits (workers at 1mSv/annum) detailed in the updated EURATOM Directive (2013).