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Largest Study of Granite Countertops Finds No Stones that Pose Health Threat

Study Samples Measure Less than Background Levels for Radon, Radiation

Cleveland, Ohio – November 17, 2008 – The most comprehensive scientific study of health threats from granite countertops did not find a single stone slab that poses a health risk. Quantities of radon and radiation emitted by stones included in the analysis all fell well below average background levels commonly found in the United States.

The scientists conducted more than 400 tests of 115 different varieties of granite countertops, including stones cited in media reports as being potentially problematic. The stones tested include types of granite that comprise approximately 80 percent of the annual U.S. market share for granite countertops, based on the most recent market data available. The study specifically included types of granite most commonly used in countertops in the United States and more exotic stones that represent a tiny share of the market. The study found:

- Not one stone slab contributed to radon levels that even reached the average U.S. outdoor radon concentration of 0.4 picocuries per liter – one-tenth the U.S. Environmental Protection Agency level for remedial action within a home. The stone slabs found to emit at higher levels – though still well below average outdoor background levels – represent a tiny share of the U.S. market for granite countertops, less than 1 percent of sales.
- Not a single stone emitted radiation levels that even approached a radiation dose of 0.3 milliSievert per year (mSv/year), the level determined by the European Commission to be negligible for human health risk; the U.S. has no such standard. However, this European standard is just 30 percent of the 1 milliSievert per year annual dose limit recommended for the general public by the National Council for Radiation Protection & Measurements.

Unlike some media reports of questionable scientific accuracy, this study evaluated a large variety of stones and used a number of complementary, well established scientific techniques to assess the exposures that people could have to radon and radiation in real-world environments and to determine whether the presence of these specific stones could compromise consumer health.

“The study showed that you are more likely to have a fatal fall from bed than to develop a health problem related to the most common granite countertops,” said Dr. John F. McCarthy, president of Environmental Health & Engineering, the independent environmental testing firm that conducted the study. “Stones were selected for the study based on their prevalence of use as countertops and media reports suggesting specific types of granite pose health risk.

“Our research program was designed to assess exposure and risk to individuals in real world conditions. The scenarios that we evaluated were selected to ensure that they represent what people will really encounter in U.S. homes,” McCarthy said. “Our research shows that some of the reports published by the media significantly exaggerate risk because they report raw data without considering real-world conditions as commonly defined by the scientific community. It is very important to put the results of these product evaluations into a context that is meaningful for the consumer.”

Study findings are consistent with an earlier review of the scientific literature, which assessed results from every identified study of radon emissions from granite published in the scientific literature to evaluate potential exposures in homes.

The new study is being submitted for peer review and publication in a scientific journal, a process that can take several months.

“Our study included detailed mapping of radiation emitted from various stones that had areas that we identified as being elevated above levels for typical granite countertop material. We found that it’s easy to get what appear to be high readings of radon or radiation from a small fraction of granite countertops, but those readings do not reflect the actual risk to consumers because they do not assess the real exposure, only isolated, extreme measurements,” McCarthy said. “As with any other type of environmental measurement, assessing the real risk to consumers must take into account more than isolated readings from small spots on a countertop. It must reflect real-world exposure scenarios and be interpreted using well established principles of environmental health.”

The study also concluded:

- Radon levels associated with emissions from granite countertops in homes are low in comparison to typical background levels of radon exposure. In other words, natural stone is a minor contributor to concentrations of radon gas within homes. These findings are consistent with an earlier review of the scientific literature that EH&E performed.
- Absorbed dose associated with radiation emissions for all of the slabs tested are well below health-protective guidelines, including the exemption limit of 0.3 mSv per year recommended by the European Commission. The United States has yet to establish an exemption level for building products based on radioactivity to our knowledge.
- A portion of stones used as countertops may contain limited areas that are enriched in radioactive materials relative to the remainder of the slab. The areas of enrichment in the stones evaluated for this study make up a small proportion of the stone, on the order of less than 10 percent of the surface area. Detailed measurements of these enriched areas showed that they make a negligible contribution to potential doses of ionizing radiation.
- Assessing exposure to radon and radiation requires accounting for duration and frequency of exposure, not just absolute magnitude. Additionally, careful consideration of several key parameters is warranted. For radon, measurements of radon flux from a countertop must account for variability across the countertop surface, the effect of any backing material on the stone, and diffusion through the slab. It is critical that ventilation is accounted for when estimating radon concentrations in indoor air from measurements of radon emissions from stones. For radiation, distance and geometry must be incorporated into dose assessments.
- While significant variability was observed across stone types, the stones at the lower end of radon emissions were found to account for the vast majority of sales and also exhibited little variability among slabs. The varieties of granite that exhibited the greatest variability of radon flux among slabs represent a small fraction of the U.S. market.

“You can never rule out anything, but [the likelihood of a granite countertop posing any health risk] is as close to zero as you could hope to get about a risk in your life based on what I know,” said David Ropeik, risk consultant and author of the book “Risk.” “Cumulatively, we have a huge body of evidence that suggests that this particular risk from granite is negligible.”

Marble Institute of America President Guido Gliori said, “This study once again proves that granite countertops do not pose the risk that some exaggerated media reports would suggest.

While some organizations that benefit financially from consumer concerns about granite attempt to spread panic, this study was designed to withstand the closest scientific scrutiny and should reassure the public about granite countertops.”

In the absence of comprehensive, independent scientific analysis of granite countertops, the Marble Institute financed the study as part of its continuing effort to define a standard test protocol to assess radiation and radon emissions from different stones. The goal is to develop protocols for testing granite in the home, in showrooms or fabrication shops and at the quarry. The fact that no single protocol exists has allowed individuals to make claims about granite countertops based on inconsistent and often incorrect tests, methodologies or analyses.

The MIA is working with the scientific community to develop a single, acceptable standard for the proper testing of granite countertops and other granite building material. Work on the standard will involve scientists and several independent and governmental agencies.

A copy of the study’s executive summary can be downloaded from the Marble Institute’s Web site, www.marble-institute.com.

About EH&E

EH&E (www.eheinc.com) has provided an extensive range of environmental and engineering consulting services for 20 years. The EH&E team consists of more than 60 experts with an outstanding record of providing business-focused solutions for issues that affect the built environment. EH&E has a depth of knowledge and credibility unmatched in the industry. The firm’s wealth of readily-accessible information is a powerful resource for its clients.

About the Marble Institute of America

For over 60 years the Marble Institute of America (MIA) has been the world's leading information resource and advocate for the natural dimension stone industry. MIA members include marble, granite, limestone, sandstone, and other natural stone producers and quarriers, fabricators, installers, distributors, and contractors around the world.

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