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COLLEGE OF AGRICULTURE, FOOD and ENVIRONMENT • LEXINGTON, KY 40546

ENERGYWISE Energy Saving Solutions from the UK Department of Biosystems and Agricultural Engineering

UK UNIVERSITY OF KENTUCKY College of Agriculture, Food and Environment

Granite Countertops

Source: Gerald Hash

RADIATION OR RADON?

The issue of radiation emitted from uranium traces in granite countertops has made headlines recently. It was also unjustly linked to elevated household radon levels. Radiation directly from uranium is one issue and can be measured, but typically is of no consequence regarding countertops.

Radon, a radioactive gas, is a third generation decomposition element of uranium (uranium ⟶ radium ⟶ radon). The half-life of this decomposition chain is such that a granite countertop could only slightly increase home radon levels. Your home foundation to ground contact will contribute eight times the radon emitted by a countertop. Also, the granite countertop contributes only one-thirteenth of the radon level warranting mitigation action per EPA protocol (4.0 pico-curies/litre of air).

Bottom-line: Enjoy your granite countertop! EPA encourages all homeowners to test for elevated radon levels resulting from foundation entry. Countertops are not a factor.

The following article[1] by Richard E. Toohey, Ph.D., from the Health Physics Society, July 24, 2008, further expounds on the subject and effectively defuses the issue.

RADIATION FROM GRANITE COUNTERTOPS

It isn't a surprise that granite emits radiation. So do other items in our households. The amount of radiation emitted from granite can vary depending on the amount of natural uranium and/or thorium concentration.

The surprise is that, in the *New York Times* article "What's Lurking in Your Countertop?" (Home, 24 July 2008), a radon measurement contractor stated that exposure rates from granite countertops in the kitchen of a summer home in upstate New York were ten times higher than in other areas of the residence. He attributed the elevated exposure rate to uranium in the granite countertops. The article reports that radon levels in the kitchen (of this home) were reported to be 100 pCi/L compared to basement levels of 6 pCi/L.

There are some altering factors when we see measurements and statements like this. First, investigation determined that the measurement procedure was not valid. The procedure used by the contractor was not appropriate (as per Environmental Protection Agency radon measurement methods) and did not provide a real idea of the amount of radon in the ambient kitchen air. Second, even if the measurement had been valid, one measurement result based on one type of granite countertop in one particular home is **not** an indication of radon exposure in any other kitchen with a granite countertop. What is needed is to measure many types of granite. So some members of the Health Physics Society did.

Our visit to a granite countertop distributor allowed measurements to be taken of various types of granite using a Ludlum microR meter. Background exposure rates outside the building and in most indoor areas ranged around 13 µR/h. All but one granite slab showed surface exposure rates in the range of background to approximately 1.5 times background (about 20 µR/h) (one slab was 80 µR/h, but was surrounded by other slabs, so the reading may have been influenced by that).

Based on the 20 µR/h reading and making some additional conservative assumptions (like no air flow mix from the kitchen to the rest of the house), we calculated an ambient radon concentration in the kitchen of 0.13 pCi/L. This is one-eighth the average household indoor air concentration level and less than one-thirtieth the EPA recommended action limit.

The bottom line: No action needs to be taken to remove granite countertops in existing homes. If there are concerns by the homeowner, appropriate radon concentration monitoring should be conducted in the living areas of the home (per EPA protocols). If readings meet or exceed 4.0 pico-curies/litre, a mitigation system should be considered.

SUMMARY: Assuming a relatively tight house with an air change rate of 0.5/hr. and using average measured dose rates from granite countertop slabs, the estimated radon concentration in kitchen air would be 0.13 pCi/L. This concentration is less than one-eighth the average radon gas concentration in U.S. homes and is well below the Environmental Protection Agency (EPA) guideline of 4 pCi/L.

[1]Source: hps.org/publicinformation/ate/cat10.html