Canadian National Radon Proficiency Program

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Consumer-Grade Electronic Radon Monitors: Testing Process

In order to provide consumers with reliable information about the performance of the various models of electronic radon monitors (ERMs), both Health Canada and C-NRPP have been conducting testing. New models of ERM have become available to consumers with increased frequency, and unfortunately many of the recent additions have shown such poor performance that they now have recalls issued against them. To help keep up with the number of new models, Health Canada tests new models on an ongoing basis at their lab in Ottawa. The results of this ongoing testing, along with the information from C-NRPP's intercomparison testing, are used to issue recalls to protect Canadian consumers.

While Health Canada tests ERMs year-round to quickly weed out models that are not functioning and should have recalls issued, C-NRPP conducts more rigorous testing of the ERMs that remain on the market, to compare their performance. This testing is performed in multiple stages, in different conditions and radon levels that mimic real-life conditions in Canadian homes.

C-NRPP's testing of the consumer-grade electronic radon monitors is performed at the Radiation Safety Institute of Canada (RSIC) National Radon Chamber. The 12 m^3 walk-in radon chamber located in Saskatoon, Saskatchewan, Canada is an approved chamber facility for C-NRPP and is a certified secondary reference radon chamber under the American Association of Radon Scientists and Technologists (AARST) National Radon Proficiency Program (NRPP), certificate number SC 1005.

Device manufacturers are invited to participate in C-NRPP's intercomparison project by providing three of the same model for each ERM to be tested. All the radon monitors are shipped unopened to the RSIC National Radon Chamber. Device manufacturers can sign up for each annual comparison through the registration form here.

RSIC staff inventory each ERM, logging the make, model, and serial number. Staff inspect each monitor for any visible damage that may have occurred during shipping, review the operating manual and download any required applications, and connect to each monitor to verify proper functioning. Any ERMs that appear to have been damaged during shipment or do not appear to be operating properly during the initial inspection are replaced prior to inclusion in the study.

The ERMs undergo four rounds of testing, in four different sets of conditions. Two sets of test conditions are at a target level of 200 Bq/m^3 since this is the Canadian radon guideline level, and the data provided by these ERMs is used by consumers to decide whether to mitigate their homes. The temperature and relative humidity for these two sets of test conditions are meant to approximate typical indoor conditions in Canadian homes during winter (Round 1) and summer (Round 2); the summer conditions representing homes with either no air conditioning or limited air conditioning. The third and fourth sets of conditions are conducted at target radon levels of 400 Bq/m^3 (Round 3) and 1,000 Bq/m^3 (Round 4) to test the instrument performance across a range of radon levels, and at temperature and relative humidity conditions consistent with Round 1.

Links to the results of each year's intercomparison testing are available on the webpage.

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