



Radon in ENERGY STAR homes

Research Summary

WHAT WE DID

We compared radon levels in ENERGY STAR and non-ENERGY STAR homes in the Omaha, Nebraska area. Using historical radon measurements from the State of Nebraska database, radon levels were compared in a sample of homes in 6 zip codes. These historical measurements included radon levels from 35 ENERGY STAR and 57 non-ENERGY STAR homes. Radon was also measured in a small sample of homes in the same area. Short-term measurements were conducted in 10 ENERGY STAR and 21 non-ENERGY STAR homes by a licensed measurement professional using EPA protocols. Measurements were taken with a continuous radon monitor in a convenience sample of six homes.

WHAT WE FOUND

In our comparison of historical radon measurements, the median radon level in ENERGY STAR homes was lower (1.4 pCi/L vs. 2.3 pCi/L) and there was a greater percentage of ENERGY STAR homes below the 4.0 pCi/L action level. For the homes that were measured in this study, results were similar. The median radon level was lower in ENERGY STAR homes (1.1 pCi/L vs. 2.9 pCi/L).

The differences in the median radon levels in both comparisons were statistically significant. Measurements conducted with a continuous radon monitor showed that radon level fluctuations were more pronounced in non-ENERGY STAR homes.

WHAT WE CONCLUDE

The ENERGY STAR homes in our study were built with extensive sealing and featured whole house ventilation via fresh air supply. Studies suggest that both sealing of the house and increasing ventilation can lower radon levels, but few studies have investigated this combination. Whole-house ventilation and a fresh air supply can have additional benefits, including increasing comfort and decreasing the concentration of indoor air contaminants like carbon monoxide, volatile organic compounds, mold, and dusts.

Residents living in the ENERGY STAR homes sampled in our study are more likely exposed to lower levels of indoor radon than residents of the non-ENERGY STAR homes. We also expect residents of these energy-efficient homes to benefit from lower energy costs and overall improved indoor air quality. Our results warrant further investigation on the potential for ENERGY STAR construction practices to reduce residential radon exposure.

Background Radon is a radioactive, carcinogenic gas that increases the risk of lung cancer. One strategy to reduce radon exposure is to incorporate radon-reducing features into new home construction. The ENERGY STAR labeling standard for new homes requires the homes to meet strict guidelines for energy efficiency. Past studies on the influence of energy-efficient construction practices on radon levels find conflicting results. This study attempts to understand radon levels in ENERGY STAR homes.

Description of Homes All homes were single-detached dwellings with basements, and they were built by the same homebuilder between 2007 and 2009.



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