Healthy Homes Grantees in Region V, Midwest

Name of Grantee: University of Illinois at Urbana, Building Research Council
Name of Project: Investigating Indoor Pollutant Concentrations in Residences with Unvented Gas Fireplaces
Amount Awarded: $576,896
Year of Grant: 2004
Contact info:
Principal Investigator, Dr. Jeffrey Gordon, 217-333-1948, jgordon@uiuc.edu
Co – Principal Investigator, Paul Francisco, 217-333-1801, pfrancisco@uiuc.edu

Project Partners: None

Summary of Project Activities:
Unvented gas fireplaces are a relatively new product in North America. As with all unvented gas appliances, unvented gas fireplaces release all combustion products into the indoor air including carbon dioxide, carbon monoxide, nitrogen dioxide, water vapor and trace levels of formaldehyde. The use of unvented gas fireplaces increases the concentration of these pollutants in an indoor environment and can reach concentrations that exceed established health-based thresholds.

This project will examine the nature and extent of potential health hazards occurring in homes with unvented gas fireplaces, provide a thorough measurement of field pollutant concentrations as well as an understanding of consumer usage patterns and housing conditions which largely determine the concentrations. The study is a comprehensive, multi-faceted project that includes theoretical modeling, laboratory testing, and field-based testing.

Partner Organizations:
None

Outcomes of the Investigating Indoor Pollutant Concentrations in Residences with Unvented Gas Fireplaces project will include:

- Creation of a comprehensive model for assessing the impact of ventless gas appliances on indoor air quality. This model will allow for analysis of pollutant concentrations based on emission rates, air change rates, unit capacities, run time and thus determine the air change rate to avoid exceeding health-based thresholds.
- Laboratory (chamber) testing of new and used gas appliances for CO, CO2, NO2, and O2 (depletion) for emission rates during different cycles, heating capacities and duration of use.
- Field testing of 30 units in homes under natural winter conditions.
- Creation of a survey to identify, for each home surveyed, the factors that are likely to affect the contaminant concentration during use.
- Create and publish a final report that will serve as the basis for 2-3 peer-reviewed papers to be presented at conferences and contained in proceedings or transactions.
The proposed project will significantly advance the current state of knowledge regarding the indoor air quality implications of unvented gas fireplaces. A better understanding of the dynamics of pollutant concentrations from their usage will benefit consumers, State and City Code Enforcement organizations and the gas fireplace industry itself.

**Product Outcomes/Outputs:**

- Creation of a comprehensive model for assessing the impact of ventless gas appliances on indoor air quality. This model will allow for analysis of pollutant concentrations based on emission rates, air change rates, unit capacities, run time and thus determine the air change rate to avoid exceeding health-based thresholds.
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