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Publisher's version / Version de l'éditeur:

National Housing Research Committee Newsletter, Spring, p. 16, 2006-03-01

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NRCC-50548

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A version of this document is published in / Une version de ce document se trouve dans:
National Housing Research Committee Newsletter March, 2008, p. 16

Improving Indoor Air Quality: New software from NRC simulates VOC concentrations

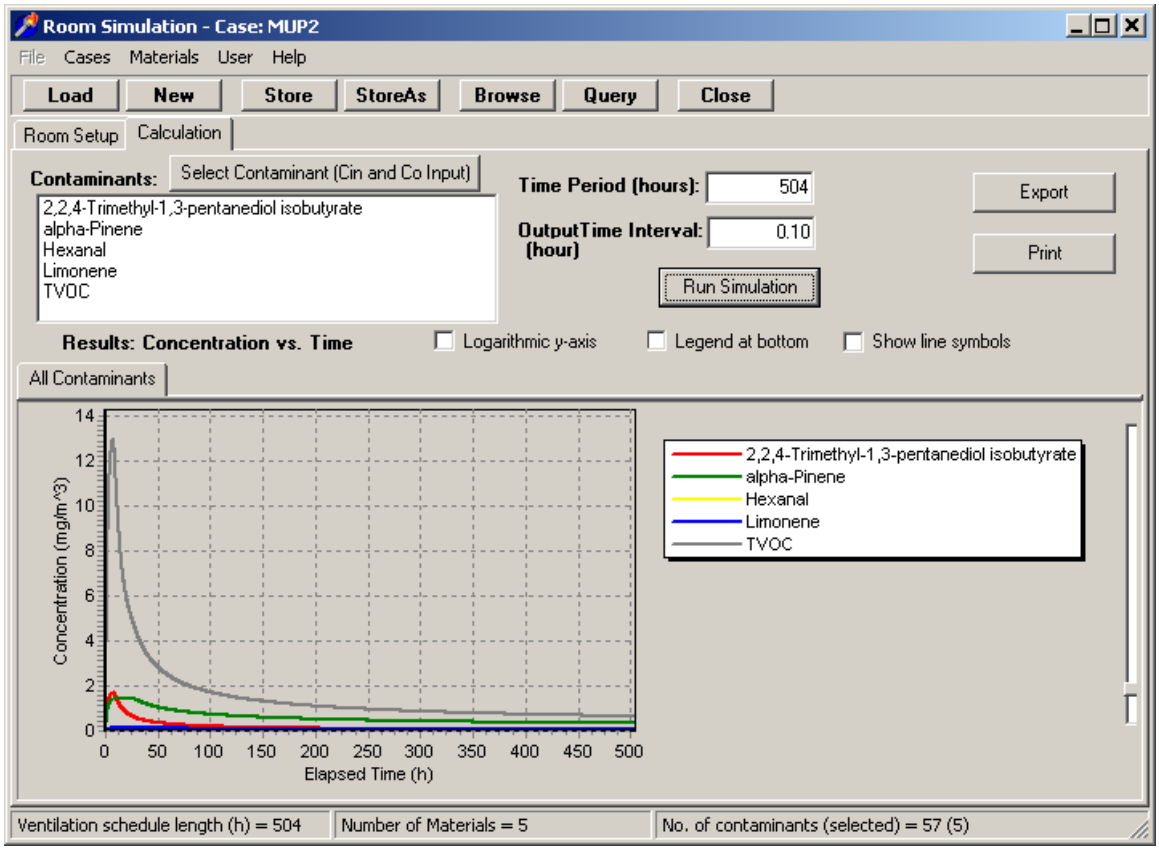
New software developed by the National Research Council's Institute for Research in Construction (IRC), with industry and government partners, is intended to take some of the guesswork out of measuring and predicting the effects of volatile organic compounds (VOCs) on indoor air quality.

Although it has been known for some time that indoor VOC concentrations often exceed outdoor levels, and that some VOCs have adverse health effects, it's been difficult to address the issue from the building design/renovation stage. There has been little guidance for manufacturers interested in creating low-VOC building materials and furnishings, or for builders and designers who want to make the right choices for low-VOC environments.

The Indoor Air Quality Emission Simulation IA-QUEST is expected to benefit manufacturers of building materials interested in developing and evaluating products, as well as builders, designers, renovators and building managers interested in creating low-VOC environments. It can be used to determine whether a particular combination of materials and ventilation strategies will immediately meet a specific air quality guideline, as well as how long it would take to do so (e.g., following renovation activities).

The software draws from a database of more than 2,600 combinations of materials and chemicals. Emission characteristics were derived from precisely controlled laboratory tests in which each material was evaluated for emission of 90 "target" VOCs. In addition to running simulations of VOC emissions, users can browse, query and search the database, review chemical The database, which currently contains around 70 common building materials, will be expanded as new products are tested and more is learned about the specific health effects of VOC concentrations.

For more information, please contact Dr. Doyun Won, (613) 993-9538; e-mail: doyun.won@nrc-cnrc.gc.ca. IA-QUEST can be downloaded from the IRC Web site at http://irc.nrc-cnrc.gc.ca/ie/iaq/iaquest_e.html.


Room Simulation - Case: MUP2
File Cases Materials User Help
Load New Store StoreAs Browse Query Close
Room Setup Calculation
Contaminants: Select Contaminant (Cin and Co Input)
2,2,4-Trimethyl-1,3-pentanediol isobutyrate
alpha-Pinene
Hexanal
Limonene
TVOC
Time Period (hours): 504
OutputTime Interval: (hour) 0.10
Run Simulation
Export
Print
Results: Concentration vs. Time
Logarithmic y-axis
Legend at bottom
Show line symbols
All Contaminants
Concentration (mg/m^3)
Elapsed Time (h)
0 50 100 150 200 250 300 350 400 450 500
0 2 4 6 8 10 12 14
2,2,4-Trimethyl-1,3-pentanediol isobutyrate
alpha-Pinene
Hexanal
Limonene
TVOC
Ventilation schedule length (h) = 504
Number of Materials = 5
No. of contaminants (selected) = 57 (5)