

IECCU Questions and Answers

Questions and answers for how to download, access, and operate IECCU

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Q: What are key features of IECCU?

A: This program has several key features:

- Unconditioned zones (e.g., attics, crawlspaces, basements, and garages) can be modeled. Temperatures in these zones are subject to diurnal and seasonal fluctuations.
- Partition and diffusion coefficients of the source and rate constants of gas-phase chemical reactions to change in response to the temperature fluctuation in unconditioned zones can be modeled.
- It can simulate interactions of gas-phase semi-volatile organic compounds (SVOCs) with airborne particles and settled dust in a multiple zone environment.
- It allows the user to import zone temperature data and indoor-outdoor and zone-to-zone air flow data from other models such as CONTAM <https://www.nist.gov/services-resources/software/contam> and COMIS <http://www.sciencedirect.com/science/article/pii/S0378778898000437> .

Q: What do I need to use IECCU?

A: Data on chemical, source, and the indoor environment to be modeled. Chemical specific data includes data on physical-chemical properties, source data includes data on short and long-term emissions, indoor environment data includes data on the type of residence, zone volumes, interzonal air flow rates, and air exchange rates. You can enter your own site-specific data or import data from other models.

Q: How do I obtain information for a required input?

A: There are many parameters required for models to be successfully run. IECCU is intended for advanced users who are familiar with indoor exposure modeling and indoor exposure assessment. Model users are referred to the open literature, EPI-suite, and PARAMS as well as the tutorials document to obtain inputs and examples for how IECCU can be run. Additional links to chemical and material-specific values are under development and will be added over time.

Q: How are IECCU data used?

A: You can use IECCU to estimate exposures to chemicals released from products or materials in residential settings or other indoor environments.

Q: What type of computer system do I need?

A: This program is compatible with Windows 7, 8, and 10 operating systems and requires a minimum of 10 MB free disk space. The screen resolution should be at least 1024 x 768 pixels. Internet connection is required only for downloading the installation package from the designated website.

Q: What is IECCU's Status and Availability?

A: The program is now available for use.

Q: Where can I find information about how IECCU calculates indoor concentrations and exposures?

A: The model documentation is contained in the user's guide.

Q: Has IECCU been peer reviewed?

A: An external (i.e., by scientists outside of EPA) peer review of IECCU was conducted in 2016. Beta-testing was also conducted in 2016 and 2017.

Revisions to the model in response to the peer reviewers' comments were completed in 2017.

The component models I-SVOC and IAQX have also been peer reviewed. IECCU was developed by combining existing code and algorithms implemented in EPA's higher tier indoor exposure models IAQX (EPA, 2000) and i-SVOC (EPA, 2013) and by adding new components and methods. The general approach and key technical aspects in developing this program are described by Bevington et al. (2017).

Bevington, C., Guo, Z., Hong, T., Hubbard, H., Wong, E., Sleasman, K., and Hetfield, C., "A Modeling Approach for Quantifying Exposures from Emissions of Spray Polyurethane Foam Insulation in Indoor Environments," Developing Consensus Standards for Measuring Chemical Emissions from Spray Polyurethane Foam (SPF) Insulation, ASTM STP1589, J. Sebroski and M. Mason, Eds., ASTM International, West Conshohocken, PA, 2017, pp. 199–227.

Guo, Z. (2002). Review of indoor emission source models. Part 1. Overview. *Environmental Pollution*, 120(3), 533-549.

Guo, Z. (2013). A framework for modelling non-steady-state concentrations of semivolatile organic compounds indoors—I: Emissions from diffusional sources and sorption by interior surfaces. *Indoor and Built Environment*, 22(4), 685-700.

Guo, Z. (2014). A framework for modelling non-steady-state concentrations of semivolatile organic compounds indoors—II. Interactions with particulate matter. *Indoor and Built Environment*, 23(1), 26-43.

Q: Has IECCU been evaluated to ensure that the model calculations are being done correctly?

A: Through beta test and peer review, model calculations have been evaluated to ensure that the equations do not contain errors. Model corroboration where model estimates were compared to measured data has been completed, however, additional empirical data is needed to evaluate model outputs.

Q: Is there a user's guide available for IECCU?

A: A user's guide for IECCU is available, and posted to the website.