

CEM Questions and Answers

How Does CEM Work?

- . CEM is a user-friendly software product that estimates inhalation, oral, and dermal exposures.
- . Allows you to tailor your exposure scenario, based on the chemical, consumer product, receptor, and environment of interest.
- . Estimates acute and chronic exposures and provides a variety of exposure metrics.

What Do I Need to Use CEM?

- . Data on the chemical, consumer product, receptor, and environment to be modeled in the exposure scenario of interest.
- . Defaults are generally available. However, the use of measured values informed by current and robust collection of exposure data is preferred.

How Are CEM Data Used?

You can use CEM to estimate inhalation, oral, and/or dermal exposures to chemicals released from products or materials in indoor environments.

What Type of Hardware and Software Requirements are required for CEM?

CEM was developed using Microsoft Access and Visual Basic for Applications (VBA), and it is compatible with 2007 and 2010 versions of Microsoft Office. A freely-available Microsoft Access runtime environment is available on the Microsoft website for users that do not have Microsoft Access installed on their computer.

What Is CEM's Status and Availability?

CEM 1.4 is available as a stand-alone draft version available for download as a zip file on EPA's website. The previous version of CEM 1.2 is available as part of EPA's E-FAST model.

Q: Where can I find information about how CEM calculates acute and chronic doses and other exposure metrics?

A: The model documentation is contained in the help screens within the model and within the user's guide.

Q: Has CEM been peer reviewed?

A: An external (i.e., by scientists outside of EPA) peer review of CEM version 1.2 was conducted in 1999. Revisions to the model in response to the peer reviewers' comments were completed. CEM version 1.4 is currently being peer reviewed and an updated version will be posted in the near future.

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

A: A user's guide for CEM is currently available.

Q: What updates occurred between version 1.2 and 1.3?

A: In the previous version (1.2) of CEM, six modules were available to estimate inhalation and dermal exposure. In version 1.3, fifteen modules are available to estimate inhalation, dermal, and oral exposure. Other major changes include:

- Additional of a near-field option for inhalation exposure scenarios
- Addition of mouthing exposure pathway
- Addition of SVOC emission from building materials
- Addition of Dermal absorption from Vapor pathway and dermal contact with articles (solids), in addition to dermal contact with products (liquids)
- Ability to use measured monitoring values and/or emission rates as opposed to model estimated values
- Addition of additional exposure scenarios for both consumer products and articles/building materials

Q: What updates occurred between version 1.3 and 1.4?

A: Based on the feedback of the Beta reviewers, the following changes have been implemented in CEM:

- Activity patterns were revised to capture mostly stay-at-home, part-time out-of-the home (daycare, school, or work), and full-time out-of-the-home residents.
- A model considering ingestion of inhaled particles that are trapped in the upper airway was added.
- An option to use products outdoors was added.
- The dermal exposure from articles model was revised to reflect CONSEXO approach and data from the OPP Residential Scenarios.
- The product applied to the ground outdoors model was revised to account for multiple product applications.
- The dermal exposure model for air-to-skin transport was revised to include a steady-state flux from the air to the skin.
- The option to specify a fraction absorbed, in addition to an absorption constant, was added to the dermal exposure models.
- Multiple options to increase the user-friendliness of the model and decrease model run-time were added, including additional help screens, default parameters, parameter estimators, search functions, and code refinements.
- Multiple options for naming, outputting, formatting, and saving reports were added.

Q: When will EPA use CEM 1.2 vs. CEM 1.4?

A: EPA is currently peer reviewing CEM 1.4, and will transition over time to the updated/peer reviewed version of CEM.