WPEM Questions and Answers

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

A: The model documentation is contained in the help screens within the model and in more detail in the Wall Paint Exposure Model (WPEM) Version 3.2 User's Guide which is available for downloading as a pdf file.

Q: Has WPEM been peer reviewed?

A: Yes. An external (i.e., by scientists outside of EPA) peer review of WPEM was conducted in 1999. Revisions to the model in response to the peer reviewers' comments were completed in March, 2001.

Q: Has WPEM been evaluated to ensure that the model calculations are being done correctly and that the results are consistent with measured results in a test house?

A: Yes. See Appendix E of the WPEM User's manual.

Q: Does WPEM contain more than one default scenario?

A: Yes. In the 'Painting Scenario' screen, click on "DESCRIPTIONS OF DEFAULT SCENARIOS" and make a note of the scenario that best meets your needs. To open that file, click on "File" at the top left hand corner of the screen, then click "Open" and select the file name you noted.

Q: The chemical I want to model does meet the requirements for a valid chemical (e.g., the chemical's vapor pressure and molecular weight are out of the range of those tested or it is a chemical that is generated during the curing or drying process), can I still use WPEM to estimate exposure?

A: You can use WPEM if you have you have emissions data from chamber studies. The emission rate of a chemical can be measured using small or large testing chambers. The American Society for Testing and Materials (ASTM) has published a standard guide for small chamber testing of organic emissions from indoor materials and products (ASTM D 5116-90). Instruction for how to enter emissions data into WPEM is provided in a help screen on the "Paint & Chemical" page by clicking the '?' next to the Paint Emissions and Primer Emissions buttons at the bottom right hand side of the screen.

Q: Can I use WPEM to estimate the exposure to other wet products such as floor vanish?

A: No. WPEM is not valid for products other than latex and alkyd interior wall paints.

How Does WPEM Work?

. WPEM is a user-friendly, flexible software product that uses mathematical models developed from small chamber data to estimate the emissions of chemicals from oil-based (alkyd) and latex wall paint. This is then combined with detailed use, workload and occupancy data (e.g., amount of time spent in the painted room, etc,) to estimate exposure.
. The output of WPEM was evaluated in a home used by EPA for testing purposes and, in general, the results were within a factor of 2. The WPEM provides exposure estimates such as Lifetime and Average Daily Doses, Lifetime and Average Daily Concentrations, and peak concentrations.

What Do I Need to Use WPEM?

. Specific input parameters include: the type of paint (latex or alkyd) being assessed, density of the paint (default values available), and the chemical weight fraction, molecular weight, and vapor pressure.

. Occupancy and exposure data are provided by the model as default values but the model is designed to be flexible and the user may select other values for these inputs: activity patterns on weekdays/weekends for workers or occupants, and during the painting event; number of exposure events and years in lifetime; room size (volume); building type (e.g., office, single family home); number of rooms being painted; air exchange rates; etc.

. For those chemicals in which the mathematical emissions model does not apply, you can enter emissions data.

What Type of Computer System Do I Need?

. Processor - IBM-compatible computer with a Pentium microprocessor (minimum speed: 33 MHZ)
. Memory - 640K
. Hard disk space - 2 MB
. Operating System - Windows 95 or higher

What is WPEM's Status and Availability?

. WPEM Version 3.2, a Windows-based tool is available. The model has been peer reviewed by experts outside EPA. This model was developed under a contract by Geomet Technologies, a subsidiary of Versar, Inc. for the EPA's Office of Pollution Prevention and Toxics, Economics, Exposure, and Technology Division, Exposure Assessment Branch. WPEM was developed under the Design for the Environment Program, Designing Wall Paints for the Indoor Environment. This project was accomplished in coordination and cooperation with the National Paint and Coatings Association (NPCA), in addition to paint manufacturers and chemical suppliers.

EPA is working on making WPEM available as a web-based model in OPPT's IGEMS platform.