

モデル名称	Wpem(Wall Paint Exposure Model)		
開発国	米国	開発機関 開発者	EPA
入手方法 (URL・価格等)	<a href="http://esm.versar.com/emlimes/imes.htm">http://esm.versar.com/emlimes/imes.htm</a>		
モデルの 目的概要	家庭及び作業環境におけるロール塗り、ブラシ塗りによる壁塗装時に排出される化学物質の曝露を推定するツール。		

## 操作手順

Wall Paint Exposure Model (WPEM)

File Help

Designing Wall Paint for the Indoor Environment

Introduction | Painting Scenario | Paint & Chemical | Occupancy & Exposure | Execution

# Wall Paint Exposure Model (WPEM)

This model has been developed as a MS Windows Application. It estimates an individual's inhalation exposure to a chemical in latex or alkyd wall paint, during and after the time when a building is painted. Various default values are provided, as well as help through ? buttons, to assist the user in providing model inputs.

**IMPORTANT INFORMATION ON MODEL LIMITATIONS**

Developed for:  
 The Designing Wall Paint for the Indoor Environment Project  
 Under EPA's Office of Pollution Prevention and Toxics (OPPT)  
 In Partnership With  
 National Paint and Coatings Associations (NPCA)

By:  
 GEOMET Technologies, Inc. (A Division of Versar, Inc.)

Office of Pollution Prevention and Toxics  
 Economics, Exposure and Technology Division  
[www.epa.gov/opptintr/exposure/docs/wpem.htm](http://www.epa.gov/opptintr/exposure/docs/wpem.htm)

- 1 「Painting Scenario」 タブをクリックする。

Wall Paint Exposure Model (WPEM)

File Help

## Designing Wall Paint for the Indoor Environment

Introduction **Painting Scenario** Paint & Chemical Occupancy & Exposure Execution

DESCRIPTIONS OF DEFAULT SCENARIOS (To access a default scenario, go to "File", "Open", and then select a .wem file from the file list.)

**Painted Building (choose 1)**

Residence:  House  Apartment

Office Building:  High-rise  Low-rise

Other:  Standard Box

BUILDING VOLUME:  ft<sup>3</sup>  ?

Entire Building  One Bedroom  % Painted  ?

AIR EXCHANGE RATE (Between Indoors and Outdoors):  air changes/hr  ?

**Painted Surface and Number of Coats**

Walls only  Ceilings only  Walls and ceiling  ?

Apply  coats of primer  ?

Apply  coats of paint Painted Surface Area  ft<sup>2</sup>  ?

2 「Painting Scenario」の欄で塗装する建物の情報を選択する。また、「Painted Surface and Number of Coats」の欄では塗装する部分を選択する。選択が終了したら「Paint and Chemical」タブをクリックする。

Wall Paint Exposure Model (WPEM)

File Help

## Designing Wall Paint for the Indoor Environment

Introduction | **Painting Scenario** | Paint & Chemical | Occupancy & Exposure | Execution

**Type of Paint (Choose 1)**

Latex:  Flat  Semi-Gloss

Alkyd:  Semi-gloss  ?

---

**Paint Density**

Primer:  grams/gal

Paint:  grams/gal

?

**Chemical**

DISPLAY CHEMICALS USED TO DEVELOP EMISSION MODELS

Select Chemical:

Molecular Weight:  g/mole ?

Vapor Pressure:  torr ?

---

Weight Fraction:  In Primer ?

In Paint ?

---

**Current Model**

Primer Emissions:

Paint Emissions:

Indoor Sinks:

3 ここでは塗料と含有化学物質に関する情報を入力する。まず、「Type of Paint」の欄で、塗料の種類を選択し、「Select Chemical」の欄で評価をしたい化学物質を選択する。選択できる化学物質は24種類あり、Molecular Weight（分子量）および Vapor Pressure（蒸気圧）はデフォルト値が自動的に入力される。入力が終了したら、「Occupancy and Exposure」タブをクリックする。

Wall Paint Exposure Model (WPEM)

File Help

## Designing Wall Paint for the Indoor Environment

Introduction | **Painting Scenario** | Paint & Chemical | Occupancy & Exposure | Execution

**Exposed Individual (choose 1)**

Professional painter
  DIY Painter (residence only)
  **Adult occupant**
 Child occupant (residence only)

**Gender (choose 1)**

Non-Specific
  Male
  Female

**Individual's Location during the Painting Event (choose 1)**

In painted area
  **In building, not in painted area (This choice does not apply if "Entire Building" is selected)**
 Not in building

**Activity Patterns**

**Exposure Parameters**

Number of Exposure Events in Lifetime:	50	events	<input type="button" value="Edit Exposure Events"/>
Number of Years in Lifetime:	75	years	<input type="button" value="Edit Years in Lifetime"/>
Average Body Weight during Lifetime:	71.8	kg	<input type="button" value="Edit Body Weight"/>

4 ここでは、曝露に関する情報を入力する。まず、「Exposed Individual」の欄では曝露対象を設定する。ここで、「Professional Painter」と「DIY Painter」では作業中の曝露、「Adult occupant」と「Child occupant」では塗装された建物で生活しているときの曝露が評価されることになる。

次に、「Individual's Location during the Painting Event」の欄で塗装している期間中に生活している場所を選択する。

入力が終了したら、「Execution」タブをクリックする。

Wall Paint Exposure Model (WPEM)

File Help

## Designing Wall Paint for the Indoor Environment

Introduction | Painting Scenario | Paint & Chemical | Occupancy & Exposure | Execution

Title of Run:

Notes:

Length of Model Run:  Days

Reporting Interval:  Minutes

Results

% Completion:

LADD	<input type="text" value="8.23E-003"/>	mg/kg-days	LADC	<input type="text" value="1.58E-002"/>	mg/m <sup>3</sup>	- or -	<input type="text" value="3.63E-003"/>	ppm
ADD	<input type="text" value="8.22E-003"/>	mg/kg-days	ADC	<input type="text" value="1.57E-002"/>	mg/m <sup>3</sup>	- or -	<input type="text" value="3.62E-003"/>	ppm
APDR	<input type="text" value="9.64E-001"/>	mg/kg-days	C peak	<input type="text" value="2.39E+000"/>	mg/m <sup>3</sup>	- or -	<input type="text" value="5.51E-001"/>	ppm
APDR Time	<input type="text" value="1.46E+000"/>	days	C 15-min	<input type="text" value="2.37E+000"/>	mg/m <sup>3</sup>	- or -	<input type="text" value="5.45E-001"/>	ppm
Single Event Dose	<input type="text" value="6.10E+001"/>	mg	C 8-hr	<input type="text" value="2.20E+000"/>	mg/m <sup>3</sup>	- or -	<input type="text" value="5.06E-001"/>	ppm

5 「Execute」ボタンをクリックすると、画面下側に計算結果が表示される。ここで、「View/Print Report」ボタンをクリックすると、印刷用の計算結果が表示される。