



IV. VOLATILE ORGANIC COMPOUNDS (VOCs)

VOCs include a variety of chemicals (e.g. formaldehyde, benzene, perchloroethylene), some of which may have short- and long-term effects. Concentrations of many VOCs are consistently higher in indoor than outdoors. A study by the EPA, covering 6 communities in various parts of the U.S., found indoor levels up to ten times higher than those outdoors B even in locations with significant outdoor air pollution sources, such as a petrochemical plants.

A wide array of volatile organics are emitted by products used in home, office, school, and arts/crafts and hobby activities. These products include:

Scents and hair sprays
finishes, rug and oven cleaners, paints, lacquers, strippers
dry-cleaning fluids
building materials and home furnishings
office products like copier, printers, corrective fluid, carbonless copy paper
glues, adhesives, permanent markers, and photographic solutions.

A. Formaldehyde

Formaldehyde has been classified as a probable human carcinogenic by the EPA. It is one of the best known VOC pollutants, and is one of the few indoor air pollutants that can be readily measured. Urea-formaldehyde foam insulation (UFFI), used in the early 1980's in now seldom installed, but formaldehyde-based resins are components of finishes, plywood, paneling, fiberboard, and particle board, and are all largely used in mobile and conventional home construction.

If formaldehyde is identified:

If possible, remove the likely source of formaldehyde.

2. If not possible, reduce exposure: use polyurethane or other sealants on cabinets, paneling and other furnishings. To be effective, all surfaces and edges must be completely covered and the sealer needs to remain intact.

REGULATION LEVELS:

The Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices (TLVS & BEIs) indicate the allowable amount for a working day of 8 hours (Time-Weighted Average -TWA) for formaldehyde is no exposure (0).

TESTING

NIOSH Method 3500: this is the impinger-chromotropic acid method (NIOSH 1984). It is a colorimetric method with a quantification limit of 0.02 ppmv for a 60-L sample. The method is subject to many negative

interferences including:

- Phenol - Higher-Molecular-Weight Alcohols
- Ethanol - Olefins

Formaldehyde diffuses into the monitor and is collected on a reactive sorbent or a liquid medium separated by a gas-permeable membrane. The sample is desorbed or an aliquot taken to the absorbing medium and analyzed by modification of the chromotropic acid method.

B. Pesticides

Pesticides sold for household use, especially impregnated strips, and foggers or Abombs, include a variety of chemicals in various forms. Exposure may cause harm if not used properly. Some active ingredients and inert components are considered possible human carcinogens.

REMEDIAL ACTIONS:

Increase ventilation when using products that emit volatile organic compounds, and meet or exceed any label precautions.

Do not store opened containers of unused paints, pesticides, and similar materials within the home, garage, or office.