

Guidance

EXPOSURE ASSESSMENT

Lauralynn Taylor McKernan, ScD CIH

Document Development Branch

Education and Information Division

National Institute for Occupational Safety and Health

Exposure Monitoring

- Determine worker exposure to diacetyl, 2,3-pentanedione, and other flavoring chemicals used in the workplace
- Evaluate the effectiveness of work practices and engineering controls
- Facilitate selection of appropriate personal protective equipment, if appropriate.

Objectives of Sampling

- Characterizing (qualitatively or quantitatively) the flavoring chemicals present in workplace air or in bulk materials
- Ensuring compliance with existing OELs
- Assessing the effectiveness of engineering controls, work practices, PPE, training, or other methods used for exposure control
- Identifying areas, tasks, or jobs with higher exposures that require additional exposure control

Objectives of Sampling

- Evaluating exposures related to production process changes and from changes in products made or materials used
- Evaluating specific high risk job categories to ensure that exposures do not exceed exposure standards or guidelines
- Measuring exposures of workers who report symptoms or illnesses

Exposure Monitoring

- Exposure monitoring should be conducted by qualified industrial hygiene personnel
- Appropriate sample handling, storage, and shipping methods should be used
- Working closely with the analytical laboratory before sampling is advised
- Accredited analytical laboratory should analyze collected samples

What to Sample

- Requires preliminary knowledge of the specific flavoring chemicals being produced or used
- Chemical, physical, and toxicological properties
- Chemical quantities in use

Whom and Where to Sample

- Sampling protocol based on objectives
- Sampling considerations include :
 - distance from a diacetyl, 2,3-pentanedione, or flavoring chemical exposure source,
 - worker mobility,
 - air movement patterns,
 - specific tasks or work patterns,
 - individual work habits, and
 - exposure controls,

How to sample

- Gas and vapor air methods,
- Methods to sample particulates in air,
- Direct reading and real-time methods
- Evacuated container sampling methods,
- Particle size distribution methods,
- Bulk air methods, and bulk material methods

Outcomes of Exposure Monitoring

- Compare results before/after engineering controls or work practice changes
- Compare with recommended OELs (8hr TWA or 15 min STEL)

Notification

- Employers should establish procedures for the timely notification of workers
- Workers should know identified exposure hazards, and any subsequent actions taken to reduce exposures
- Employers should ensure that workers understand their role in helping to maintain a healthful workplace