



Diacetyl exposures in coffee roasting and grinding facilities and non-production areas

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This poster session examines diacetyl exposures of employees who conduct coffee roasting, grinding, and packaging, as well as potential exposures in non-production areas such as the warehouse and offices.

Description

Diacetyl exposures can vary greatly and can often exceed the occupational exposure limits for employees who roast and grind coffee. Elevated levels of diacetyl vapors can also permeate to other parts of the facility including warehouse and office areas.

Situation/problem

Air sampling for diacetyl exposure was performed to determine the extent of migration of fugitive vapors in facilities that perform coffee roasting, grinding, and packaging.

Methods

Samples were collected at two different facilities that conduct coffee roasting, grinding, and packaging. Samples were collected through two 600 mg tubes in series that contain specially cleaned and dried silica gel.

Sampling duration, at an average flowrate of 0.07 L/min, ranged from approximately 90 – 120 minutes to determine time-weighted average (TWA) concentrations. Air sampling equipment included the use of MSA Escort ELF sampling pumps with low-flow adapters.

The tubes were wrapped in aluminum foil during and after sampling to protect the samples from light exposure. Tubes were positioned at the worker's breathing zone. The sampling train flow rates were pre- and post-sampling calibration-verified using a Bios DryCal primary calibrator (Serial #109295). All post-sampling flow rates were within 5 percent of pre-sampling values.

The samples were analyzed using OSHA ID-1016 and OSHA 1013 method at the Liberty Mutual Industrial Hygiene Laboratory in Hopkinton, Massachusetts, an AIHA Accredited Laboratory. (Certificate #100045).

Results/conclusions

Diacetyl results for grinders and roasters ranged from 0.037 ppm to 0.089 ppm, which are 370 – 890 percent of the ACGIH-TLV of 0.01 ppm.

Samples in non-production areas ranged from 0.013 ppm to 0.059 ppm (130 – 590 percent of TLV), most likely due to air pressure differences in entranceways near production areas.

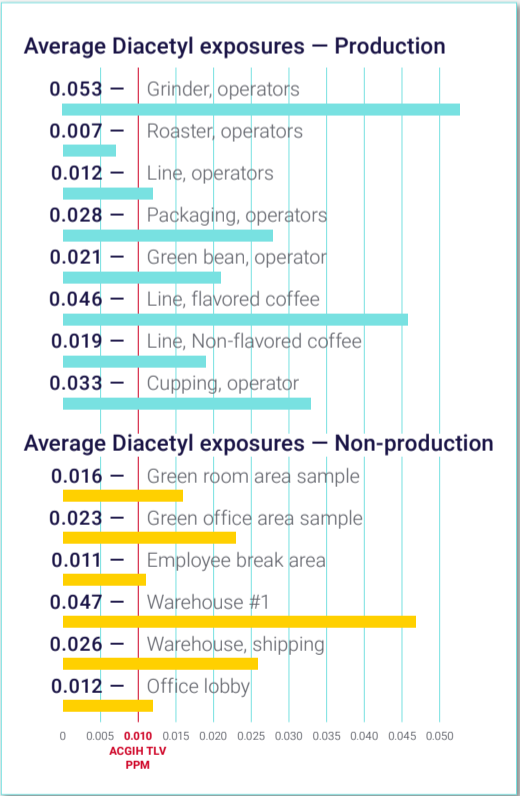
Sampling shows that although building ventilation is removing some diacetyl vapors from the facilities, diacetyl concentrations remain elevated in both production and non-production areas.

Conclusions

Elevated concentrations in non-production areas show that employees not previously thought to have diacetyl exposures can be overlooked when assessing exposures and control plan options.

There are opportunities to greatly reduce this exposure for non-production employees by increasing awareness of the hazard and implementing improved controls (e.g., changes in air pressures between production and non-production areas, improved door seals, etc.) for diacetyl vapors in all areas of the coffee roasting and grinding facility, including non-production areas.

To reduce employee exposures, production employees with elevated diacetyl exposures should wear respiratory protection as an interim control until engineering controls can be implemented.



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