



IHBULLETIN

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Green Building Council Lowers the LEED Formaldehyde Criteria

The U.S. Green Building Council (USGBC), the non-profit organization behind the LEED (Leadership in Energy and Environmental Design) Green Building Rating System™, approved a new version of standards at its meeting in November 2008. You may hear these new standards referred to as "Version 3" or "LEED 2009". Among the changes included is a reduction in the formaldehyde concentrations allowed during IAQ testing under the LEED Indoor Environmental Quality (EQ) Credit 3.2.

The LEED rating system allows building projects to score points across six categories. One of those categories, and perhaps the one most significant



to industrial hygiene air sampling, is for Indoor Environmental Quality (EQ). While the EQ category did not see the signifi-

cance of change of some the other five LEED categories, the formaldehyde change is important for Galson Laboratories' clients to note.

LEED 2009 is a 110 point certification system. To claim points for Credit 3.2 in the EQ category, an indoor air quality (IAQ) management plan must be developed and implemented



before occupancy. As part of that plan, when a building is ready, occupancy points can be earned in the EQ category by

either performing a "flush-out" or by IAQ testing.

A flush-out of a building is performed by supplying specified volumes of outdoor air per square foot of floor space while maintaining internal



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temperatures and relative humidity at specific levels. Along with additional criteria, internal finishes must be completed and furniture must be installed. Flush-outs can be difficult to perform for several reasons and many clients often opt for IAQ monitoring.

The IAQ option involves air testing and requires conducting baseline IAQ testing to show that contaminant levels do not exceed those noted in the table below.

Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with the United States

Environmental Protection Agency Compendium of Methods for the Determination of Air Pollutants in Indoor Air.

For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from the same locations as in the first test.

EQ Credit 3.2, Concentrations to Not Be Exceeded		
Contaminant	Maximum Concentration	Comments
Formaldehyde	50 parts per billion	27 parts per billion when 2009 standard is released
Particulates (PM 10)	50 micrograms per cubic meter	
Total Volatile Organic Compounds (TVOC)	500 micrograms per cubic meter	
4-phenylcyclohexene (4-PCH)	6.5 micrograms per cubic meter	<i>Only required if any carpeting or fabrics with styrene butadiene rubber latex backing material are installed in the building</i>
Carbon Monoxide (CO)	9 parts per million (PPM) & no greater than 2 PPM above outdoor levels	



The air sample testing shall be conducted as follows:

1. All measurements shall be conducted prior to occupancy, but during normal occupied hours, and with the building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.
2. The building shall have all interior finishes installed, including but not limited to millwork, doors, paint, carpet and acoustic tiles. Non-fixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.
3. The number of sampling locations will vary depending upon the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq.ft., or for each contiguous floor area, whichever is larger, and include areas with the



least ventilation and greatest presumed source strength.

4. Air samples shall be collected between 3 feet and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.¹

The following general air sampling and analytical procedures are available for each respective contaminant, including:

- a. Formaldehyde—8-hour samples collected on treated sorbent tubes in accordance with Modified NIOSH 2016/ EPA Method TO-16.
- b. Particulates—A continuous measurement for airborne particulates (PM10) throughout an 8-hour period using a TSI Sidepak aerosol monitor or equivalent. Alternately, collect air samples for laboratory analysis using a PEM sampler designed for PM10 particulate collection, pump and filter.
- c. TVOC—8-hour whole air samples analyzed in accordance with Modified OSHA PV2120/Modified EPA TO-15. Individual compound



identification and concentrations detected can also be reported if requested.

¹ U.S. Green Buildings Council, LEED® for New Construction for Ballot Tracked Changes. Downloaded from the internet, 12/07/2008. URL no longer available.

- d. 4-PCH—collect samples on thermal desorption tubes in accordance with EPA-TO-17 to meet the reporting limit of 6.5 ug/m³, collect at least 12 L (sampling rate of 0.005-0.2 LPM)



- e. Carbon Monoxide—A continuous measurement for carbon monoxide for an 8-hour period using a direct-reading real-time indoor air quality monitor such as a TSI Q Trak IAQ monitor. The monitor used may simultaneously measure and record other IAQ parameters such as carbon dioxide, average temperature, relative humidity, etc., dependent upon the model used.

The Galson Laboratories industrial hygiene laboratory staff has the experience and qualifications to assist in defining air testing required during implementation of the LEED IAQ Management Plan prior to building occupancy. For more information about air sampling for LEED requirements, contact a Galson client service representative, toll free, at [888-432-LABS \(5227\)](tel:888-432-LABS) or with IHLIVE Online Chat at www.galsonlabs.com.

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