

USGBC LEED® IEQ Credit 3.2 Flush-Out Testing:

Utilizing the WolfPack IAQ PLUS (or DirectSense IAQ PLUS) as a Highly Efficient Screening Tool for “Option 2, IAQ Air Testing”

One full credit is offered by the US Green Building Council for LEED IEQ credit 3.2 in new and renovated buildings. This requires the air handling system in the building to be run, or the space “flushed out”, for a period of days or weeks ahead of occupancy. There is also the option of a two-phase flush-out, with a stage of HVAC operation ahead of occupancy, and then some additional flush-out with significantly higher than normal outdoor (dilution) air being delivered during initial occupancy.

Such flush-outs can have negative economic consequences resulting from delayed occupancy, and due to the energy costs associated with heating or cooling the additional outdoor air being delivered during the flush-out. However, if a range of specific parameters are measured below prescribed levels, the flush-out period may be reduced or eliminated, while providing added assurance that occupants will not be subjected to elevated pollutants associated with construction and new building materials; pollutants that

may detrimentally impact the productivity, and long-term health of the occupants.

Parameters to be measured (per LEED Reference Guide for Green Building Design and Construction, 2009 edition):

Total Volatile Organic Compounds	(TVOCs)	Target <500µg/m ³
Carbon Monoxide	(CO)	Target <9 ppm, and no more than >2ppm above outdoor levels
Particulates	(PM10)	Target <50µg/m ³
Formaldehyde	(HCHO)	Target < 27 ppb
4-Phenylcyclohexane	(4-PCH)	Target: <6.5µg/m ³ This measurement is only required for spaces where carpeting or fabrics with styrene butadiene rubber (SBR) backing has been installed. GrayWolf does not measure this parameter.

GrayWolf's WolfPack IAQ PLUS system measures VOCs, CO, %RH and Temperature. With the optional PM-205 or PC-3016-A connected, it will also simultaneously display and data-log particulates. Trend logging of all of these parameters can provide valuable information about the dispersion of measured pollutants, as well as if there are certain building operating conditions where pollutant levels might rise.

Formaldehyde (HCHO) can also be measured with an RK-FP30 handheld optical meter; supplied by GrayWolf. While readings from the RK-FP30 are not directly logged into the WolfPack (or DirectSense) logger, they may be manually added, in-situ, into the same data file with the balance of parameters with GrayWolf's "User Readings" feature.

All of the WolfPack readings are virtually instantaneous, while the RK-FP30 test for Formaldehyde takes 30 minutes.

This set of tests will indicate when a building will pass the requirements as set out by LEED IEQ credit 3.2, option 2. However, as LEED 3.2 defers to a 20-year-old USEPA guideline¹ regarding sampling methodology, there is some debate as to the acceptance by USGBC of some of the state-of-the-art sensors employed by the WolfPack and DirectSense, and it is up to the end-



user to determine if additional testing via SUMMA canisters or sorbent tubes, with samples sent for lab analysis, might be necessary. In fact, recent studies indicate that results from various air sampling methods for LEED 3.2 testing may vary dramatically².

Of course, sending out one set of air samples (once confidence has been established by the GrayWolf IAQ PLUS kit that they will pass) is far more time and cost efficient than sending out daily air samples until the tests pass.

In addition to LEED 3.2 testing, the IAQ PLUS kits also measure Carbon Dioxide, for verifying adequate dilution air distribution to specific occupied areas, Temperature and %RH for thermal comfort evaluation, and have options for Differential Pressure for pollutant pathway determination and a choice of numerous specific gases including ozone, ammonia and hydrogen sulfide.

These kits may also be utilized for walk-thru and long-term monitoring of general Indoor Air Quality parameters, an important component of an IAQ program (baseline studies and response to complaints). The CO₂ sensors may also be used to assure compliance with LEED IAQ Prerequisite 1 (minimum air quality performance) and to verify calibration of fixed sensors implemented for LEED IEQ credit 1.0 (outdoor air delivery monitoring). The WolfPack's optional differential pressure option may be used to provide measurement and documentation of maintaining positive pressure in occupied areas adjacent to construction areas, as per LEED IEQ credit 3.1.

Footnotes

¹ USEPA Compendium of Methods for the Determination of Air Pollutants in Indoor Air, 1990.

² M Azad, Comparison of TVOC Sampling and Analytical Methods Used for Green Building Evaluation/LEED, AIHA Conference, Toronto, 2009



WolfPack with PM-205

AUTHOR DETAILS

Rick Stonier
Partner

GrayWolf Sensing Solutions
Advanced Environmental
Instrumentation
6 Research Drive
Shelton, CT 06484 USA
Tel: (203) 402-0477
Fax: (203) 402-0478
Email:
RickS@GrayWolfSensing.com
Web:
www.GrayWolfSensing.com