LEED BD+C: New Construction | v4

# Indoor air quality assessment

Possible 2 points

Glossary

## Intent

To establish better quality indoor air in the building after construction and during occupancy.

## Requirements

Select one of the following two options, to be implemented after construction ends and the building has been completely cleaned. All interior finishes, such as millwork, doors, paint, carpet, acoustic tiles, and movable furnishings (e.g., workstations, partitions), must be installed, and major VOC punch list items must be finished. The options cannot be combined.

**Option 1. Flush-out (1 point)**

**Path 1. Before occupancy**

Install new filtration media and perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot (4 267 140 liters per second of outdoor air per square meter) of gross floor area while maintaining an internal temperature of at least 60°F (15°C) and no higher than 80°F (27°C) and relative humidity no higher than 60%.

**OR**

**Path 2. During occupancy**

If occupancy is desired before the flush-out is completed, the space may be occupied only after delivery of a minimum of 3,500 cubic feet of outdoor air per square foot (1 066 260 liters per second of outdoor air per square meter) of gross floor area while maintaining an internal temperature of at least 60°F (15°C) and no higher than 80°F (27°C) and relative humidity no higher than 60%.

Once the space is occupied, it must be ventilated at a minimum rate of 0.30 cubic foot per minute (cfm) per square foot of outdoor air (1.5 liters of outside air per second per square meter) or the design minimum outdoor air rate determined in EQ Prerequisite Minimum Indoor Air Quality Performance, whichever is greater. During each day of the flush-out period, ventilation must begin at least three hours before occupancy and continue during occupancy. These conditions must be maintained until a total of 14,000 cubic feet per square foot of outdoor air (4 270 cubic meters of outdoor air per square meter) has been delivered to the space.

**OR**

**Option 2. Air testing (2 points)**

After construction ends and before occupancy, but under ventilation conditions typical for occupancy, conduct baseline IAQ testing using protocols consistent with the methods listed in Table 1 for all occupied spaces. Use current versions of ASTM standard methods, EPA compendium methods, or ISO methods, as indicated. Laboratories that conduct the tests for chemical analysis of formaldehyde and volatile organic compounds must be accredited under ISO/IEC 17025 for the test methods they use. Retail projects may conduct the testing within 14 days of occupancy.

Demonstrate that contaminants do not exceed the concentration levels listed in Table 1.

**Table 1. Maximum concentration levels, by contaminant and testing method**

| Contaminant | Maximum concentration | Maximum concentration (Healthcare only) | ASTM and U.S. EPA methods | ISO method |
|---|---|---|---|---|
| Formaldehyde | 27 ppb | 16.3 ppb | ASTM D5197; EPA TO-11 or EPA Compendium Method IP-6 | ISO 16000-3 |
| Particulates (PM10 for all buildings; PM2.5 for buildings in EPA nonattainment areas, or local equivalent) | PM10: 50 micrograms per cubic meter PM2.5: 15 micrograms per cubic meter | 20 micrograms per cubic meter | EPA Compendium Method IP-10 | ISO 7708 |
| Ozone (for buildings in EPA nonattainment areas) | 0.075 ppm | 0.075 ppm | ASTM D5149 - 02 | ISO 13964 |
| Total volatile organic compounds (TVOCs) | 500 micrograms per cubic meter | 200 micrograms per cubic meter | EPA TO-1, TO-15, TO-17, or EPA Compendium Method IP-1 | ISO 16000-6 |
| Target chemicals listed in CDPH Standard Method v1.1, Table 4-1, except formaldehyde | CDPH Standard Method v1.1–2010, Allowable Concentrations, Table 4-1 | CDPH Standard Method v1.1–2010, Allowable Concentrations, Table 4-1 | ASTM D5197; EPA TO-1, TO-15, TO-17, or EPA Compendium Method IP-1 | ISO 16000-3, 16000-6 |
| Carbon monoxide (CO) | 9 ppm; no more than 2 ppm above outdoor levels | 9 ppm; no more than 2 ppm above outdoor levels | EPA Compendium Method IP-3 | ISO 4224 |

ppb = parts per billion; ppm = parts per million; µg/cm = micrograms per cubic meter

Conduct all measurements before occupancy but during normal occupied hours, with the building ventilation system started at the normal daily start time and operated at the minimum outdoor airflow rate for the occupied mode throughout the test.

For each sampling point where the concentration exceeds the limit, take corrective action and retest for the noncompliant contaminants at the same sampling points. Repeat until all requirements are met.