

UCIAQ Building Flush-Out Fact Sheet

Removing Indoor Air Pollutants from Newly Constructed and Renovated Buildings

Introduction

This document was created by the University of California Indoor Air Quality (UCIAQ) Workgroup, a sub group of the UC Industrial Hygiene and Safety Committee (UCIH&SC). It is intended to be a resource for both Building Industry and Environmental Health & Safety professionals, such as Project Managers and Occupational/Environmental Health specialists.

What Is a Building Flush-Out?

Newly constructed, renovated, and remodeled buildings can emit air pollutants from various components used in the construction process such as adhesives, paint, carpet, furnishings, etc. In an effort to remove indoor air pollutants, some buildings undergo a pre-occupancy flush-out where a large amount of tempered outdoor air is forced through the building via the ventilation system. A flush-out typically lasts between 3 to 30 days depending on the building material and furnishings, allowing the majority of pollutants to be removed from the building prior to occupancy.

When to Perform a Flush-Out

A flush-out is recommended for all buildings or parts of buildings that are newly constructed or extensively remodeled. Consider a building flush-out even in circumstances where low-emitting building materials are used. A building flush-out should be carefully planned due to time, costs and possible occupancy delays. For LEED projects, a building flush-out can be performed to earn credit for a Construction Indoor Air Quality (IAQ) Management Plan. For more information please refer to the [Flush-Out for LEED Credit](#) section below.

Flush-Out versus Bake-Out

In contrast to a flush-out which uses tempered outdoor air, a bake-out refers to increasing the building temperature up to 100°F in order to “artificially age” building materials. The effectiveness of a bake-out has not been proven and may damage the mechanical ventilation system or building components. Furthermore, research shows that levels of volatile organic compounds (VOCs) after a bake-out are sometimes greater than before the bake-out. During a bake-out, VOCs can be released and reabsorbed by walls and furnishings in the building. Likewise, it is possible that warping or damage of interior finishes and/or the HVAC system will occur at these heightened temperatures. The UCIAQ committee strongly recommends a building flush-out instead of bake-out.

Flush-Out Procedures

Optimally a building flush-out begins as soon as HVAC systems are operational and extends through the end of construction, furniture installation, and the first few days of occupancy. The minimum recommended flush-out period is 7 days; it should be completed prior to occupancy and after all finishings are installed. The HVAC system should be run continuously, 24 hours a day, with 100% outside air (no return air should be re-circulated into the building). Outdoor air is to be thermally conditioned as needed to maintain normal indoor temperatures. In humid climates, it is important to avoid introducing significant amounts of moisture during the flush-out period. Temporary construction filters should be installed in the air handlers during the construction period and through the duration of the flush-out. These filters must be replaced after the flush-out is completed. Note: The above recommendations may not meet requirements for earning LEED credits for a project.

Flush-Out for LEED Credit

Implementing a Construction IAQ Plan can secure credits for obtaining LEED certification for a newly constructed or remodeled building. A building flush-out is one strategy for earning a credit for a Pre-Occupancy Construction IAQ Management Plan. The other is through IAQ testing. In most cases performing a building flush-out is more time and cost effective. The flush-out procedure for securing this credit depends on the specific project and which version of LEED it has been registered under. More information can be found on the US Green Building Council (USGBC) website www.usgbc.org.

For More Information

In addition to the USGBC site, more information on indoor air quality and building flush-out procedures can be found at the websites listed below:

<http://www.epa.gov/iaq/schools/tfs/guidej.html>

<http://www.epa.gov/iaq/schooldesign/portables.html>

<http://www.doh.wa.gov/ehp/ts/IAQ/schooliaqbmp.pdf>

<http://www.ewg.org/files/advisory.pdf>

<http://buildingcommissioning.wordpress.com/2008/01/10/leed-building-flush-out/>