



Diagnosing and Mitigating Odors in Buildings

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Diagnosing the source of an odor in a building can often times become frustrating, as no obvious source of the odor can be found. I have found the following procedure to be helpful in diagnosing the source of the odors in buildings.

Air Testing. Measuring the indoor concentrations of air contaminants is NOT very helpful in diagnosing the source of the odor. While you get the concentrations of a bunch of chemicals, many have no odor threshold data and the results themselves do not point to what is the source. Furthermore, trying to identify the odor source by comparing the indoor air concentrations to the chemicals identified in the material MSDS is difficult as manufacturers are not required to list all chemicals (i.e., ‘secret’ ingredients) and there can be reaction products formed that are not in the original product.

Since the problem is an odor, the straightforward approach is to use the sense of smell to diagnose the source of the odor.

Step 1. Identify the rooms with the odor. If it is not obvious that the odor is only in one room, then open up all windows and interior doors and if there is a forced air heating/cooling system then turn on the fan to circulate the air. Then go get a cappuccino or two and come back in an hour. Turn off the forced air system, close all interior room doors, and go get another cappuccino and come back in an hour. Have a note pad and write down your perceptions of the strength of the odor in each space; none, slight, moderate, strong. First check the room just inside the front door. Then go back outdoors and refresh your nose for 30

seconds, and then holding your breath enter and go to the next room and record the odor strength and then return outdoors to refresh your nose. Repeat for all rooms.

Step 2. Identify contents as the source of odor. This is basically diagnostics by elimination. First take out all of the contents, air out the room, and recheck the room for odor. If the odor goes away then the odor is related to one or more of the contents, and can be diagnosed by moving the suspected contents into a similar but odor free room and seeing which ones can recreate the odor.

Step 3. Identify building materials as the source of odor. If the contents are determined to not be the source of the odor, then it must be from one of the building materials in the room (i.e., walls, floor, ceiling, insulation). There also could be odor transport from an adjacent space such as a crawlspace or attic, so check the odor in those spaces first. For assessing materials as a source of the odor, take a small piece of each material and put it into a clean odor free wide mouth mason jar. Let the samples sit overnight at room air temperature and then open the lids and smell each material and record the strength of the odor. The material with the strongest odor that matches the odor in the room is the culprit material.

Step 4. Mitigating the odor. Once the source of the odor has been identified the odor can be mitigated in a number of ways.

Removal. The for sure straightforward way is to remove the material that is causing the odor. Sometimes materials that have been in contact with source material will also require some mitigation.

Encapsulation. Sometimes the odor can be mitigated by applying a low permeability coating or barrier material to the surface of the material. You can pilot test this in a mason jar.

Air Pressure. Sometimes the odor can be mitigated by using fans to depressurize the cavity where the material causing the odor is located.

Chemical Treatment (Ozone). Chemical treatments such as ozone are NOT recommended.