Considerations For Piano Humidifying Systems
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Pianos, both grands and uprights, require a reasonable level, and stability, of humidity to properly maintain the instrument. Specific manufacturers have their particular recommendations, but for this author a reasonable level means between 35 and 45 percent relative humidity, with extremes over a year not to exceed a low of 30% nor a high of 50%.

There are several reasons for concern about humidity. It begins with the wood that is a major portion of the construction of a piano; wood changes dimension when humidity changes, so there can be major effects on tuning stability, tuning pin tightness, wood finishes, wood veneers, wood action parts (if not the latest carbon-based parts), potential cracking of soundboards, tonal quality of hammers, and the stability of the glues that are pervasive throughout the piano construction and its action mechanism.

It should also be noted that maintaining a stable humidity environment is not unique to a piano; it also applies to other musical instruments such as a violin or cello. Humidity control is also a consideration for the interior of homes, both for health and maintenance reasons. For homes heated with forced air circulation, with which this author has some familiarity, and as a function of the region where one lives, it can be common to have an active dehumidifying system (for the Summer) as well as an active humidifying system (for the Winter).

Piano tuner-technicians are often asked about how to control the humidity environment for a piano. There are systems sold and installed by piano technicians for dehumidifying as well as systems for humidifying. The rest of this short article will concentrate mostly on piano humidifying systems, but is not meant to imply that dehumidifying is not also important.

I am often asked questions about a potential purchase, as well as the installation and maintenance of piano humidifying systems installed directly within an upright or a grand piano. I will now provide a list of the several

considerations that I discuss with my customers. These represent, and are limited to, my personal understanding of the topic.

1) Health Considerations. Piano humidifying systems have a water reservoir, and solutions are sold to be added to each fill-up to avoid bacteria, mildew, mold, and perhaps other conditions associated with standing water. The chemical composition of the additives that I've recently looked at have warning labels for handling of the liquid and to keep it away from children, but I have not seen an analysis of whether there are air born particle health issues from ongoing use in a humidifying system. Contents listed that I've seen include (a) <1% of CAS #68424-85-1 (CAS being an American Chemical Society classification.), (b) Benzyl-C12-18-alkyldimethyl ammonium chlorides, (c) Quaternary ammonium compounds, Benzyl-C8-18-alkyldimethyl compounds, chlorides, and lastly (d) of both CAS 7732-18-5 and CAS 8030-78-2. I have done a little Web searching, including on the SDS (Safety Data Sheet) for CAS #68424-85-1, but I am not a chemist and am reluctant to offer an opinion about safety. I would suggest that any potential consumer do their own research in advance of a purchase of a system that may put minute quantities of these types of chemicals into their home air.

2) Whole house alternative. My personal preference, for both humidifying and dehumidifying control for a piano is whole house humidity control as part of the HVAC system. For most newer houses in my area this is a given – they appear to already have it. My second choice for piano humidifying control is a room humidifier, like those sold on Amazon for around $100. Third choice is the old-fashioned approach of margarine cups filled with water in them and positioned on the plate of a grand or inside an upright.

3) Electrical safety. From a safety perspective, particularly with grand pianos, I personally do not consider it desirable to have electrical wiring and electrical connections within reach of small children or pets. Simultaneously having accessible water also associated with an electrical systems, in my view, further exacerbates the safety risk.

4) Cost. Both initial purchase and installation, as well as ongoing

maintenance by both the homeowner and their piano technician.

5) Complexity. Consider the complexity of the piano-humidifying installation plus its potential physical interference with future servicing of the instrument. Its main parts include a status light panel, electrical wires, water bucket, moisture deflector shield, multiple heater rods, humidistat, clamps, an electrical cord going to a wall outlet, filler hose, etc. Follow the installation directions carefully when installing, and double-check an installation done by a previous piano technician when first servicing a piano.

6) Potential damage. A properly installed system should work fine. But if there is improper installation, improper long-term maintenance, neglect, or a malfunction, there is a risk of both water damage and electrical hazard. When servicing a piano with an installed humidification system, always include a check for its continued correct operation.

7) Pin block protection. In grands, a piano-based humidity control system is mounted underneath the soundboard and does not directly protect the pin block.

8) Use of distilled water. Depending on your geographical area, if your water is like it is in my area you should use distilled water in the reservoir instead of hard tap water.

9) Operational sequence. From my observations, the humidistat in dual humidifying/dehumidifying piano-based systems is a mechanical SPDT (Single Pole Double Throw) relay set for (say) 42% Relative Humidity. Therefore one function is always active. After the humidifier portion of the system puts enough moisture in the air to reach 42% RH, it turns on the drying rods to actively reduce humidity and thereby undo a portion of what it just achieved. And vice versa.

10) 365-Day Operation. For a piano installation that includes both humidifying and dehumidifying, I suggest that a strategy be developed to halt

the addition of water to the reservoir during summer months when there is less need for purposely increasing humidity. This could involve ignoring an indicator light indicating that water is to be added to the reservoir.

11) Carbon Footprint. This final point is on the dehumidifying portion of piano humidity control systems. We all have been making changes in our lifestyle to lower global emissions, including reducing home energy usage. For example, our home light (LED) bulbs usually utilize 4 to 7 watts each now, whereas previously they were 40 to 100 watts each. Piano dehumidifier systems installations nowadays can often contain two, or maybe even three, heater rods, with each rod using 25 to 50 watts. So when the dehumidification is active, the energy used can easily be the equivalent to turning on roughly 20 light bulbs in a home. Consider instead creating installations using only one 25-watt heater rod for dehumidification in non-extreme humidity environments, and downgrade any existing installations that use more than 25 watts when active.