Moisture Control

The single most important aspect of bagpipe maintenance is the issue to moisture control. An instrument that varies with respect to moisture can never be stable or reliable.

Water traps, desiccant systems and pipe bags must be chosen to be suitable for the climate in which you live and the proper considerations for maintaining an appropriate moisture level.

Moisture absorbed into a reed makes it both heavier and more flexible, so the native pitch of a wetter reed is different (generally lower) than that of a dryer one. If the pitch changes as you play, you'll have a problem. If the level of moisture in the bag is too high, the reeds will become wet in the short term and will mildew in the long term. (Mildew is evidenced by a black color on the reeds.) For this same reason, the pipe chanter should never be left inside the bag when not in use. It should be kept outside the bag with a reed protector in place. I'd also recommend swabbing out the chanter stock after each day's playing to remove water or saliva that may be absorbed into the wood. Swab out the drones and chanter stock on cold days.

Condensed moisture in the drones results in funny noises, instability and eventually drone "shut-down". It can swell hemp leading to frozen joints. If it soaks into the wood, it can cause cracks. This moisture comes from the passage of your humid breath into the drones where it hits cooler ambient air. When the extra moisture content coming from your breath is more than the ambient air can hold, you'll get condensation. A "little" condensation can be tolerated, but at some point, you're in trouble.

The amount of condensation depends upon the air flow through your drones (lots of moist air flow = lots of condensation), the relative humidity of that air (desiccated air contains less moisture than non-desiccated = less condensation) and the ability of outside air to accept the extra humidity going up the drones (lower relative humidity in the outside air and/or warmer temperature = less condensation).

I'll wager you've never seen your breath come out the chanter or drones - even when the water condenses on the cool surfaces inside the drone. That's because of a fairly high mixing ratio of ambient air and your breath in the drones.

This is a good place to bring up the fine point that, on a given day, plastic pipes may have more condensate than non-plastic pipes. The thermal conductivity of plastic is higher than that of wood, so when you are playing on a cool day, the bore of a plastic pipe will be losing heat faster than a wooden pipe and will be colder than that of a wooden pipe. A colder bore represents a surface for more or earlier condensation.

OK, so where does that leave us? We know that the air leaving our pipes has some amount of moisture in it. That moisture needs to be absorbed into the ambient air. If it cannot be absorbed at the temperature in the bores, the moisture will condense in our drones. On Saint Patrick’s Day, even with a moisture control system I end up **POURING** water out of my drone reeds. The water runs down the drones and into the drone reeds shutting them off.

There are two major forms of moisture control systems, 1) water traps and 2) desiccants/absorbents

Moisture traps deal mostly with spit (yes spit!). The first thing they do is divert the spit away from the chanter reed toward the back of the instrument. This is usually done with an elbow a tube. If the trap has an elbow, then the larger water/spit particles will be knocked out because they aren't carried along in the flowing stream of air. The medium sized "bits o' spit" will fall out of the air stream and collect in the tube. This is an aerodynamic issue in which particles obey "stoke's law". This law says that big particles fall faster in a viscous fluid and that small particles will remain suspended longer. The slower the fluid is moving, the more efficiently the particles are removed. This is best done in a large diameter, long tube so that the air is moving slowly and you catch most of the particles that fall out. There are obvious practical there are practical limitations. In particular, very small particles of water will remain suspended for a long time and will go through the trap.

Desiccants and absorbents are materials which have the ability to attract moisture from the air. If desiccant is dry, has a high surface area and the flow rate is slow, the relative humidity of the air can be significantly reduced before it reaches the reeds. Desiccants do have limitations in that the humidity of the air passing over the desiccant will increase as the desiccant becomes more and more laden with moisture. Hence, you should use "dried" desiccant on those cold damp days when you know you need it. The ability of a desiccant to absorb moisture is also a function of temperature.

Which ever system you choose, controlling moisture is part of pipe maintenance and will dramatically effect how your pipes play.