

Moisture and Your Hearing Aid

Moisture is the leading cause of hearing aid failure, according to manufacturers. Some moisture problems are obvious, such as droplets visible in the tubing of BTE instruments. Most, however, are not so apparent. The fact is, moisture-related failures—and distortion caused by moisture—are very difficult to diagnose. It is a good idea to suspect moisture when obvious causes such as weak batteries are eliminated.

How Does It Get There?

It might be helpful to understand how moisture gets into your hearing aid to begin with. The chief problem is **condensation**. What causes this condensation? Simply put, warm air holds more moisture and cold air holds less, so moving from a warm environment to a cooler one can cause condensation. This is the same condensation effect seen on a cool bathroom mirror after a hot shower. Similarly, entering an air conditioned building on a warm or humid day will cause condensation, because the cooler inside air cannot hold as much water vapor (that's why air conditioners put out so much water). Under these conditions—not unusual for most of us in our normal lives—the water vapor condenses as moisture. It is important to understand that in most cases you will not see this condensation, because most problems are caused by moisture *molecules*, not visible droplets. Even though you can't see them, you will usually notice their presence, because your hearing aids will not sound as good, you will notice distortion, you might have intermittent failures or faulty switches, or they will simply stop working.

How Do I Get Rid of It?

A. Heat. Until the introduction of Dry & Store®, elimination of moisture was difficult. The reason is that surface tension, the scientific phenomenon that causes moisture molecules to lock onto one another like magnets (and ultimately causes a drop to form), binds water molecules to the inside of the hearing aid like glue. Fortunately for hearing aid users, as the temperature is raised the surface tension decreases, and thus the “glue” holding the moisture to the inside surfaces and electronics is reduced. So, we now know...

the first thing necessary to dry a hearing aid is heat.

But—as hearing aid manufacturers tell you in their instruction manuals—too much heat can damage or destroy the sensitive instruments (that's why hair dryers and microwave ovens are no-no's). Dry & Store operates at a temperature of 90° to 95° F, the ideal temperature for getting the moisture molecules moving without damage to the aid (also the optimum temperature for the special absorbent material described later).

B. Moving Air. Unfortunately, the moisture molecules that are “unglued” from the inside of the hearing aid by adding heat do not readily leave the aid on their own. Without help getting out, they will bounce around inside the hearing aid until the temperature returns to normal, whereupon they can condense once again as moisture, sometimes onto more sensitive parts of the hearing aid than where they started! So it is important to get them moving *out* of the hearing aid. Here's a kitchen analogy that explains why: If you take a pot of water and bring it to a boil without a cover, the water will vaporize and the vapor escapes easily into the kitchen air. If you take the same pot of boiling water, but this time cover the pan with a lid having a small hole, the vapor can escape, but much more slowly. If the heat is subsequently shut off, much of the water which was vaporized will cool and condense back into the pot.

A hearing aid is much like a pot with a small hole in the cover. The small size of the hole allows *some* water molecules to escape on their own, but the rest need help, in the form of moving air—and a desiccant. Dry & Store circulates 9 cubic feet per minute of warm air in a precise pattern over and around the hearing aids in its closed conditioning compartment. This air circulation causes water molecules to migrate *out* of the hearing aid, so they cannot condense again. So, we now know...

the second thing necessary to dry a hearing aid is moving air.

And now the final piece to the puzzle—a desiccant.

Ear **Technology** Corporation

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C. The Desiccant. A desiccant is a substance that has a high affinity for water and is used to absorb moisture. In a process scientists call diffusion, moisture will move from wet areas to dry areas. In the dry environment inside Dry & Store, moisture will move from the hearing aid to the dry air outside of the hearing aid, aided by the continuous flow of warm air. The air flow described in **B**, above, ensures that the moisture molecules that are moving out of your hearing aid come into contact with the desiccant so that they can be absorbed. A large desiccant, such as the one used in the Dry & Store conditioning system, strips huge amounts of moisture from the air moving by, making the air increasingly dryer and able to pick up even *more* moisture. In fact, the relative humidity inside Dry & Store, aided by the patented desiccant's 13.6 square inches of absorptive surface area, can drop to below 20%, creating this ideal environment for moisture to migrate out of your hearing aid. So, we now know...

the third thing necessary to dry a hearing aid is a desiccant.

Summing Things Up.

The three things needed to effectively dry hearing aids are heat, but just the right amount, to break the surface tension; moving air, to help move the released moisture out of the hearing aid; and a desiccant, to create an ultra-dry environment and permanently remove the moisture molecules.

Now you, the hearing aid user, are an expert on moisture and drying. You should also be aware that Dry & Store is the *only* product on the market to combine these three needed technologies, plus we've added a germicidal lamp as well. The following comparison chart shows how we stack up:

	<i>Dry & Store</i>	Dry Aid Kits	Heated Boxes
Heat	✓		✓
Moving Air	✓		
Desiccant	✓	✓	
Kills germs	✓		
Removes odors	✓		
Attractive and Safe Storage	✓		

The Bottom Line.

Your hearing aids will sound better, they will last longer with fewer repairs, and in many cases itchy ears will be a thing of the past. A nationwide survey of Dry & Store users yielded the following results:

- 98 % of users were satisfied with their Dry & Store purchase.
- 77 % said that their hearing aids sounded better since they started using Dry & Store.
- 72 % of those who had itching ears or recurring infections of the external ear canal indicated that the symptoms went away or were reduced since they started using Dry & Store.
- 67 % of those who had experienced distortion, failures, or other problems requiring repair said that the problems were eliminated completely or reduced by Dry & Store use.
- 54 % of users who kept their batteries in the hearing aid (battery compartment open) during Dry & Store conditioning reported increased battery life.

Isn't it about time you treated yourself or a loved one to Dry & Store?