Air Duct Sanitizing Is Nothing to Sneeze At

By Steve Okun

It seems like technology advances have positioned carwash and detail operators for another unexpected retail opportunity: air duct sanitizing. For those who consider the evidence, apply available rationale, and seize the opportunity, this new continuous maintenance process may prove to be another profitable customer retention tool.

About fifteen years ago The Harvard Medical School Health Letter called attention to a fairly significant phenomenon affecting those of us who use automobile air conditioners. Automobile air ducts are a breeding ground for bacteria, molds and other allergens that cause some form of respiratory distress in roughly one out of five Americans.

"Switched-On" Stuffy Nose, Watery Eyes and Cold-Like Symptoms

The "summertime cold" appears to be more directly related to an infestation inside air conditioning ducts than simply the season of the year. Once inside an enclosed vehicle, passengers are a captive audience to air-borne irritants swirling around and being inhaled. Often, but not always, a stale telltale odor generated by the bacteria protein is noticeable for a short time. Either way, if molds and allergens affect you or your customers, relief may well be within your grasp.

A study published in the New England Journal of Medicine had identified the problem after investigating the coincidence of allergic reactions such as allergic rhinitis and bronchial asthma when associated with automobile air conditioners. Under closer scrutiny, it was discovered that the damp dark environment of air conditioning ducts inside automobiles provided very good to thriving growing conditions for various forms of fungi and offensive microorganisms that cause irritation of the sinuses and respiratory system.

The Market Is Huge — The Fixes Plentiful

Because there is such a large audience of both active and prospective sufferers, allergy remedies have created a substantial following in the pharmaceutical industry. Allergists have become a vibrant growth area of specialized medicine, and over-the-counter cures abound.

Many pill-popping Americans have developed an ever-growing appreciation for alternative solutions to drugs that better address their ills, and seem eager to explore healthier ways to make their world more "livable". Faced with the news that their car's air conditioning ducts are a wellspring of mold and allergen growth, most drivers will undoubtedly seek effective solutions to the problem. You may recall the first newspaper ads, complete with graphic of an ugly dust mite, that spirited millions of homeowners to have all of the ductwork in their house cleaned and sanitized. Once convinced that a potential problem existed, consumers were quick to act. The photo of the squiggly figure undoubtedly helped get the message across.

Actually, many of these ugly microorganisms are ever present in daily life, with allergens being no exception. An increasing number of the newer automobiles are placing even greater emphasis on interior air filtration in response to consumer feedback concerning air quality, indicating the consumer market is ripe for this fresh innovative service. Again, carwashers and detailers find themselves uniquely positioned in the right place… at the right time!

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How Do You Treat an Air Duct?

As the old adage goes… where there's a will, there's a way. Some methods seem more credible than others, as well as easier and less expensive. So, caveat emptor… and do your homework.
The choices for air duct treatment range from sprays to gasses, with many divergent claims and opinions. One of the fixes used to remove odors from vehicles is also suggested for eliminating the microorganisms, so you may already have the resources needed to start your new service.

As a general rule, deodorizers may not be able to eliminate the molds and other pesky allergens harbored inside the air conditioning ducts, depending on their classification within these various product types:

1. **Masking Agents**, often referred to as time-released agents, are simply perfumes and fragrants used to cover up any malodor by merely overpowering the offensive odor with a more pleasant one. Air fresheners are masking agents, and offer no ability to eliminate microorganisms.
2. **Sorbent Agents** are designed to absorb humidity and dull the malodor. If moisture is removed, microorganisms are less likely to flourish. A very common sorbent called baking soda may already be in an open box sitting in your refrigerator.
3. **Filtration Agents** actually are used to screen and absorb certain malodors; one most commonly used agent is activated charcoal. Although their use may prevent or inhibit growth, neither have the capability to actually eliminate microorganisms.
4. **Pairing Agents**, as the name suggests, actually combine with molecules of the malodorous substance, and are carried off in droplets as a pairing. These droplets are then cleaned up and discarded. The use of a fogger is most conspicuous in this process, and is commonly called "washing the air". If the pairing agent is a reactant chemical, the malodor molecules may actually react to form an entirely new substance that does not emit a malodor. Products like the new odor eliminator sprays for fabrics and carpets utilize this methodology, but makers readily admit that once they dry, their pairing activity ceases. Although some chemical companies offer clones of these consumer products under the guise of killing bacteria and allergens, they have no ability to kill microorganisms.
5. **Disinfectants** and **Sanitizers** manage malodors by controlling or destroying microorganisms when they produce gasses as part of their normal life cycle or during putrification.
6. **Enzyme deodorants** consist of bacterial organisms that produce various kinds of enzymes that in turn feed on and digest proteins, starches and other materials. They work best in fibers of fabric and carpeting, but some chemical companies claim they can also treat hard surfaces. Evidence suggests that if that is so, the activity ceases when the product dries. The newer enzymes are somewhat temperamental towards the environment in which they work best, making their performance somewhat inconsistent. Enzyme deodorants are aggressive chemicals and carry a risk of skin and respiratory irritation. They are greatly affected by temperature and moisture with regard to their efficacy.
7. **Residual Antimicrobials** have metallic properties that inhibit or eliminate growth of microorganisms. Man has used residual antimicrobials, for example, in antifouling agents to paints used on the hulls of marine vessels to inhibit fungicidal growth.

8. **Bonded Antimicrobial** agents have been most recently used in fabrics of surgical gowns and drapes, and also in fabric camping equipment and wear. Footwear utilizes the agents to inhibit foot odor. Antimicrobial agents have enjoyed good success in carpet fiber preparation to inhibit mold and mildew growth conspicuous to fibers and moisture. Most of the uses of antimicrobial agents are directed to preventive activity and inhibiting initial growth of microorganisms while also suppressing odors.

All the available research strongly suggests that of the eight categories of deodorizers, only the disinfectants and sanitizers have the ability to effectively eradicate microorganisms living in air conditioning ducts.

Air ducts are often partially made of a non-durable or semi-durable materials that do not sustain being doused by liquids and aggressive chemicals. Furthermore, most air ducts are for the most part inaccessible to effective spraying or even fogging methodologies. To be effective, the process must get into all of the little nooks and crannies that are tightly enclosed within the ductwork and connections.

Microbiologists agree that for antimicrobial action to be effective, the sanitizing activity must actually touch the affected areas, either by direct contact or through heavily moisture-laden vapor as a carrier.

The most penetrating action in dealing with difficult to reach ductwork is by utilizing a gaseous substance that permeates and sanitizes all of the surfaces being treated. That gas is electronically generated ozone, frequently referred to as nature's sanitizer.

OZONE Is Most Effective Sanitizer

Because of its unique capabilities, ozone appears to be the best way to treat air ducts for antimicrobial infestations like mold and other fungi, as well as a broad host of other bacteria. Ozone is one of the most powerful oxidizers known, making it a very effective sanitizing agent in both air and water. Ozone works 3125 times faster than chlorine and is a 50% stronger oxidizer than chlorine, yet is perfectly safe when used as directed.

Ozone has been used for over a century as an antimicrobial agent, and is safer and more effective than chlorine in water treatment. It is routinely used in food industry sanitizing in the control and reduction of pathogens in fresh food products like meats, fish, fruits and vegetables. There are no bad residues left by the oxidation effect on foods, and the usefully unstable ozone always reverts back to its natural form. Ozone is considered by most to be the best available technology for microorganism control and a much better alternative to chemicals. Ozone is the only safe and natural alternative for perishable foods, and is safe equally for the environment.

In an effort to improve our environment by reducing the use and storage of toxic chemicals, ozone's environmental benefits become more popular. The very thing that protects the earth from radiation and cleans our atmosphere is the most powerful oxidizer available commercially. Ozone has rapidly become a purifier of choice because it pierces the cell wall of bacteria and virus microorganisms on contact, destroying them three thousand times faster than chlorine. Once ozone performs its oxidizing and purifying tasks, it reverts back to oxygen.

Air borne allergy symptoms can be greatly reduced or eliminated by the use of ozone to oxidize air borne pollens, bacteria, molds and fungi odors as well as pet dander. Accordingly, many allergists prescribe ozone air purifiers for their patients.

If Some Is Good, More Is Better

When treating air ducts for microorganism infestation, "overkill" is the name of the game. The more powerful the agent, the quicker and more effective the process. That means that the level of ozone gas needed well exceeds the levels determined by OSHA to be safe for humans, indicating that the vehicle being treated must be unoccupied and closed.

What is Ozone O_3 and How Does It Work?

Ozone is a trace constituent of the atmosphere which is naturally produced by the ultraviolet rays of the sun. Ozone is an unstable blue gas with a very characteristic odor that is easy to recognize, and in low levels makes the air smell fresh and its color makes the sky blue.

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The name ozone is due to the characteristic odor and derived from the Greek “ozein” which means to smell.

When O_3 comes in contact with odor producing particles and bacteria, the oxidation process occurs. Here’s how it works. In nature, ozone is created by either ultraviolet energy or lightning. Conspicuous to many lightning storms is the lingering clean “spring fresh” fragrance that is present directly after a rainstorm. When ozone is created artificially, the most effective process involves man-made lightning by way of a corona transfer of electricity. Ozone is generated when oxygen is passed through a very high voltage field surrounding the electrodes. The corona energy field breaks apart the oxygen (O_2) molecule, producing monatomic oxygen (single, uncombined oxygen atoms). As the atoms are bombarded, they combine with more stable oxygen molecules and form tri-atomic oxygen, or ozone (O_3). The ozone molecule is extremely reactive with microbiological and organic contaminants and upon contact, will break down the cell structure of bacteria microbe and kill it. Ozone attacks and oxidizes smoke and other organically based molecules and compounds that cause odor and atmospheric contaminants. Because ozone is a very unstable atomic structure, it reverts back to an oxygen molecule very quickly after oxidation occurs. Any air-borne byproducts quickly dissipate in the open air. When done properly, the process is safe, clean, quick... and effective.

How Long... How Much... and How Good?

In most cases, an ozone air duct sanitizing requires 10-minutes of processing, and a 5-minute airing out period upon completion. If severe malodors are also present, the process may require additional time, so plan accordingly if the odor is really intense.

Since the only labor involved in the process is placing the machine and turning it on, attendant time is minimal. Most units have automatic timers that shut-off when the job is completed.

Remove Malodors the Same Way

Removing “the stink” means getting to the source. Most of the offensive odors found in cars are organic. To effectively rid the interior fibers of malodor, the organic residue causing the offending odor must be removed, and the bacteria must be killed. In many cases, odors are caused by organic protein spills, like food or excretions.

Any remaining residues must be cleaned up and the affected surface should be cleaned or shampooed. Often times, a germicide is mixed with the shampoo to kill any remaining bacteria. Some chemical products offer shampoo with germicides and fragrance all mixed together for easy application.

Not All Ozone Units Are Created Equal

Essential to malodor removal is “overkill”. In order for ozone to be an effective deodorizer, ozone must be concentrated into a potent oxidizing gas. Clearly, the more powerful the ozone unit, the less time will be needed to rid interior malodors.

Not all ozone machines generate the same level of ozone, so carefully check the ozone-generation performance features as well as the manufacturer guarantees before purchasing. Prices are competitive, and the operating cost of a typical ozone unit rivals the utility cost to light a 75-watt bulb.

Additionally, its wise to keep the ozone generator “outside” of the vehicle, thus enhancing its ability to find and convert oxygen without the risk of ozone molecules attacking the innerworkings of the generator itself. Ozone is carried into the vehicle by a hose through an ajar window. The window opening is then sealed with foam inserts to contain the ozone in the car’s interior, thus pressurizing the interior space with purifying ozone.

Organic odors can be effectively eliminated by ozone oxidation. Most odors such as smoker’s tobacco residue, urine, food spills, sour decay, mold, fecal material, sickness residues, body odor, blood, pet odors, kerosene, noxious gasses, and viral malodor are easily treatable. Additionally, ozone is the most effective way to kill mold spores in air conditioning ducts and vents.

What are the risks and where is the downside?

When used properly, ozone is quite safe. As a word of caution though, ozone is a toxic gas that must not be ingested instead of air. Lungs are designed for breathing oxygen, not ozone.

Temporary exposure to high concentrations of ozone can cause watery eyes, coughing and a stuffy nose. Foolishly disregarding the recommended airing-out process and allowing prolonged exposure to the residual ozone may risk severe headaches to occupants. However, this type of built-in warning system will likely cause a person to leave the presence of ozone. Following manufacturer directions will keep the process safe and easy.

Technically, oxidation has a deteriorating effect on genuine rubber parts, but only after a prolonged period of exposure. The ozone exposure to interior finishes and materials is very slight and brief, so any genuine risk of degradation is miniscule.

Air Duct Sanitizing Can Become Routine Maintenance

Making our surroundings more healthful is a growing concern among most Americans. Most of us spend a large amount of time encased in automobiles, usually with windows closed up for protection and convenience. We are living inside a container on wheels and susceptible to the same sick building syndrome that plagues some permanent structures.

Vehicle interiors are composed primarily of man-made materials that often give off a vapor that is most noticeable as a light coating on the windows. We practically live in a semi-sealed, air-conditioned, climate-controlled environment that is delivered through a system of air ducts. Studies have shown a direct connection to duct-grown molds and allergens and their causal impact on upper-respiratory distress.

Carwashes and Detail Shops Have Unique Opportunity

Once considered only a niche market, ozone expands from a specialized odor removal process to a more mainstream position of serving the majority of motoring Americans. Where else can you envision a more suitable place to provide another express service that creates a powerful new reason for customers to frequent your business?

Recognizing the opportunity and using it to distinguish your operation may mean thousands of additional dollars in revenue. Moreover, it gives your clientele another reason to come back again… and again. Ozone isn’t merely for malodor removal anymore. Now its also the sweet smell of success!

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