PROTECTING YOUR INDOOR AIR QUALITY

GUIDE TO HELP PROTECT YOU & THE AIR QUALITY IN YOUR HOME by ***Hoff Htg & A/C***

WAYS TO PROTECT THE AIR IN YOUR HOME

I. AIR FILTRATION SYSTEM

- A high efficiency air filtration system can capture the smallest of particles. Some high efficiency filters can even capture particles at the micron level. These tiny particles include many contaminants that cannot be detected by the eye but can affect one's respiratory system.

II. UV LIGHTS & PARTICLE IONIZERS

- UV Lights, particle ionizers, and other products in their family do not capture contaminants like a filtration system. Their applications are used to electrically neutralize or kill indoor air contaminants. They are most effective when used in conjunction with a good air filtration system.

WAYS TO PROTECT THE AIR IN YOUR HOME

III. FRESH AIR FOR THE HOME

- Over the years, homes have continued to be built tighter with improved insulation. Although better for energy efficiency, it does not allow fresh air to infiltrate the home and dilute indoor contaminated air. Getting fresh outside air in your home is one of the most recommnded ways to help with your home's Indoor Air Quality.

IV. INDOOR HUMIDITY CONTROL

- A home's relative Indoor humidity is recommended to be within the range of 30% to 60%. Either being below or above those parameters can cause different sorts of problems. Ideal humidity range typically is 35% to 40%. Different products & recommendations can help reach those levels as humidity can fluctuate widely with different seasons.

I. AIR FILTRATION

Explanation of different air filter Merv ratings & high efficiency filtration systems

How does a highly Merv rated furnace air filter help clean my air?

- A furnace air filter MERV rating designates the efficiency of the air filter. The official MERV rating means " **Minimum Efficiency Reporting Value".** Simply stated, the higher the number the better the filter is at capturing particles it comes across.
- As the air is blown throughout your home, the air filter is the first line of defense to protecting the quality of the air in your home. A typical 1" fiberglass furnace air filter bought at the local store may have a Merv 1- Merv 4 rating. These filters are designed to protect the furnace equipment itself but won't help clean the air in your home. Conversely, the 1" higher efficiency filters have a Merv 10 rating and above. These are more costly to purchase but are much more efficient at capturing the smallest of contaminants. The chart on the next page lists the different Merv Ratings for filters and what those filters will be able to capture.

MERV Rating	Air Filter will trap Air Particles size .03 to 1.0 microns	Air Filter will trap Air Particles size 1.0 to 3.0 microns	Air Filter will trap Air Particles size 3 to 10 microns	Filter Type ~ Removes These Particles
MERV 1	< 20%	< 20%	< 20%	Fiberglass & Aluminum Mesh ~ Pollen, Dust Mites, Spray Paint, Carpet Fibres
MERV 2	< 20%	< 20%	< 20%	
MERV 3	< 20%	< 20%	< 20%	
MERV 4	< 20%	< 20%	< 20%	
MERV 5	< 20%	< 20%	20% - 34%	Cheap Disposable Filters ~ Mold Spores, Cooking Dusts, Hair Spray, Furniture Polish
MERV 6	< 20%	< 20%	35% - 49%	
MERV 7	< 20%	< 20%	50% - 69%	
MERV 8	< 20%	< 20%	70% - 85%	
MERV 9	< 20%	Less than 50%	85% or Better	Better Home Box Filters ~ Lead Dust, Flour, Auto Fumes,Welding Fumes
MERV10	< 20%	50% to 64%	85% or Better	
MERV 11	< 20%	65% - 79%	85% or Better	
MERV 12	< 20%	80% - 90%	90% or Better	
MERV 13	Less than 75%	90% or Better	90% or Better	Superior Commercial Filters ~ Bacteria, Smoke, Sneezes
MERV 14	75% - 84%	90% or Better	90% or Better	
MERV 15	85% - 94%	95% or Better	90% or Better	
MERV 16	95% or Better	95% or Better	90% or Better	
MERV 17	99.97%	99% or Better	99% or Better	HEPA & ULPA ~ Viruses, Carbon Dust, <.30 pm
MERV 18	99.997%	99% or Better	99% or Better	
MERV 19	99.9997%	99% or Better	99% or Better	
MERV 20	99.99997%	99% or Better	99% or Better	

Why is it *NOT* normally advised to purchase a 1" filter with High Merv Rating?

- The typical central heating & air conditioning system basically operates in a continuos loop manner. The return air duct transfers air flow ***through the air filter*** where it is either heated or cooled and then dispersed throughout your home registers. The return air grills then transfer that air back into the return air ducting system where the process is repeated as needed. Many 1" filters with high Merv rating are extremely dense & thick. Most furnaces & air handler systems are not designed to have such a dense filter. While these High Merv filters will capture very small particles, it comes at the expense of restricting the necessary air flow through the filter. In these scenarios, the high efficiency filter can cause additional problems that can cause your system to stop either heating or cooling depending on the season. For people that choose to use 1" filters with a high Merv rating, they should be monitored very closely & changed more frequently. ***The key is to find the RIGHT air filter that will clean the air in your home without restricting the air flow!***

What Merv Rating air filter is recommended?

- If using a 1" Air Filter for your home, a Merv 8 rated filter is what Hoff Htg. & A/C typically recommends. These filters will typically be your better filters to capture dust particles and contaminants of that nature. These filters normally provide your best filtration without restricting the air flow too much. Just keep in mind that the better the air filter, the more contaminants it will catch. This means the air filter may have to be changed more frequently.
- We highly recommend upgrading to a 5" wide box filter system for those wanting a more efficient filter. Box filter systems have more surface area being 5" wide . This allows the ability to capture smaller particles that can affect the respiratory system. However, there are still some brands of box filters that may restrict air flow. For that reason, Hoff Htg. & A/C recommends Lennox' Healthy Climate Air Filter products. The Lennox Healthy Climate 5" Air filter has a patented design that has proven to be highly efficient without restricting your air flow much more than the common 1" air filter. **That is the reason the Lennox Healthy Climate HC16 Air filter continues to be THE TOP RATED #1 air filter!**

II. UV LIGHTS & PARTICLE IONIZERS

How UV Lights & Particle Ionizers Work & Recommended Applications

How are UV Lights Used For Air Purification?

UV light is an invisible form of electromagnetic radiation. A UV-C light functions as an agent to destroying contaminant cells. UV light harms cells by destroying nucleic acids and disrupting their DNA, which either kills them or leaves them incapacitated. After prolonged exposure to UV light, cells are unable to perform their vital functions. The neutralized contaminants either fall to the ground or are captured with a filtration system. As stated earlier, UV lights are most effective when used in conjunction with a high efficiency filter.

What is difference between UV-C Light & Particle Ionizer?

UV Lights & Particle Ionizer products both destroy contaminants electrically. The main difference between them all are the methods used to achieve that. Particle ionizers & those in its family create positive & negative ions to attract to contaminants to neutralize or kill the cells. However, the end result is the same as most UV-C lights. Again, it is also most effective when used with high efficiency filter,

III. FRESH AIR FOR THE HOME

The Importance of Ventilation & Outside Fresh Air

How important is ventilation & fresh air for controlling indoor air quality?

- According to the EPAs most recent guidelines for home IAQ, ***VERY IMPORTANT***!! The EPA guideline's list adequate ventilation & fresh air as critical for achieving a healthy home. The goal is to flush unwelcome odors, chemicals, & other contaminants out of your home immediately upon creation through proper ventilation. If you can't flush the unwelcome contaminants out through ventilation, fresh outside air is the solution of choice to dilute whatever unwelcome particulates remain in the home. Many new homes automatically are forced to accept this reality. An ERV (Energy Recovery Ventilator) Fresh Air Heat Exchangers & Outside Fresh Air Piping systems have become increasingly required for new homes being built.
- When conditions prevent the installation of an ERV for Fresh Air Piping system, there is another easy option— **OPEN YOUR WINDOWS !!!** Opening windows to allow air exchanges is a tried & truth method used for many years. Unfortunately, due to an expanding population that have allergies, this simple method is not an option for everyone.

IV. HUMIDITY CONTROL

Information & Methods To Achieve Optimal Indoor Humidity

What humidity percent is recommended for optimal Indoor Air Quality in my home?

- An indoor humidity level percent ranging from 35% to 40% is optimal. That range is listed as optimal as studies have shown it to offer the greatest amount of personal comfort. However, a range from 30% to 60% is listed as "acceptable" as detailed by ASHRAE & EPA standards. Issues may develop if humidity levels fall below or above those parameters. **LOW** humidity (below 30%) can cause scratchy throats & sinus issues. Shrinking woodwork in the home & increase in static electricity may also occur in addition to health considerations. **HIGH** humidity levels (above 60%) fosters an environment where Mold may develop & grow. Either too little or too much humidity each present different potential issues to occur.

What options are there to *increase* indoor humidity?

- Whole House Humidifiers are the most recommended method to ADD humidity in your home as needed. These units will inject humidity into the airstream with your central heating blower system. Bypass humidifiers rely on a ducted system that solely work with furnace blower. Power humidifiers have their own blower installed to directly inject humidity into the airstream. Steam Humidifiers work by vaporization of water & expelling the steam into ducting systems. The humidity is controlled by a humidistat where one can set their desired humidity level.
- Portable humidifiers can also help. Although they cost slightly less than a whole home humidifier, they are far less effective and require more maintenance. Portable humidifiers are useful products for those that wish to add humidity to a certain room or area.
- Other ways to naturally increase indoor humidity include: 1) Boiling water on stove 2) Letting clothes air dry after washing 3) Adding houseplants to home that will release humidity 4) Letting shower door open without ventilation fan operating when showering

How can I *decrease* the humidity level in my home if too high?

- Whole Home Dehumidifiers have become increasingly popular as the preferred method to dehumidify. These products are normally installed to work through a home's central ducting system. Some of the more advanced dehumidifiers even allows the option to be used a central dehumidifier OR as a standalone dehumidifier. Standalone dehumidifiers are easy to use & commonly applied in damp basements and cellars.
- Most homes are now equipped with central air conditioning to cool the home. An added benefit of an air conditioner is the ability to dehumidify as part of the process. However, a common MISPERCEPTION is that an air conditioner takes the place of a whole home dehumidifier. An air conditioner's primary function is too cool the home. It will shut off when the desired temperature is reached without any attention to what indoor humidity levels may be. Nonetheless, negative performance by your air conditioning system will impact the ability for an air conditioner to dehumidify even as a side benefit. Some air conditioning systems will produce cool air but may not be working correctly. Systems that have dirty evaporator coils, dirty blowers, or low refrigerant charges may produce cool air but not work efficiently to dehumidify as needed.

CONCLUSION

You spend most of your time indoors whether it be at school, work or home. Poor indoor air quality can lead to negative health consequences. Nevertheless, there are ways to improve indoor air quality and create a healthier indoor environment.