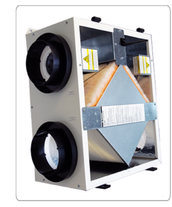
# Indoor Air Quality





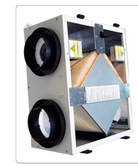
**Ventilation, Spray Foam, Tight Houses:**

RESIDENTIAL SYSTEMS: The construction of the residential envelope is getting tighter and tighter. Products such as icynene, high density spray foam, and cellulose insulation are creating little or no infiltration into the building. This is great way to reduce the heat loss/gain of a building. However, fireplaces, gas appliances, and boilers and water heaters require fresh air to function correctly. People need a supply of fresh air that is not too dry or too moist to stay healthy. There must be a way to remove all of the volatile byproducts of the out-gassing process from new interior surfaces and finishes. So as buildings have reduced infiltration, their energy use drops but the indoor air quality can suffer. We have several tools to improve this situation:

**No more bath fans – the modern way is to use an ERV or HRV:**

In the residential application, we eliminate the bathroom exhaust fans normally installed by the electrician and replace them with ductwork that will connect to an ERV (energy recovery ventilator) or HRV (heat recovery ventilator) unit. From the unit, this exhaust will continue and terminate to the free atmosphere outside. We then bring in fresh air from outside through ductwork that is also connected to this unit. It crosses through the heat exchanger inside the ERV and picks up the heat from the outgoing exhaust air and is delivered to an alternate location of the building or into the supply of the warm air/cooling system. This unit is then activated with the same electrical switch installation that would normally power the electrician's bath fan. In the summer, operation can be reversed and warm fresh outside air can be cooled by outgoing cool stale exhaust air.

In commercial applications, especially public buildings, there is a specification for the amount of fresh air that needs to be introduced to the building envelope. Building codes usually require 15 cubic feet per minute (cfm) of air per person. Sending this fresh outside air through an HRV or ERV is very important to reduce high energy costs and requires a great amount of design and knowledge to ensure that it will work well other air systems such as exhaust hoods.



**ERV: Energy Recovery Ventilator:**
An ERV is able to transfer both heat and moisture from the outgoing stale air and the incoming fresh air. We sell the Renewaire EV90 because of its simplicity, efficiency, and rugged construction.
https://www.renewaire.com/wp-content/uploads/2018/10/MAR_LIT_123_RGB_Homeowners_Guide_Indoor_Air_Quality.pdf

**HRV: Heat Recovery Ventilator:**
An HRV is able to transfer just heat from the outgoing stale air to the incoming fresh air. We sell the Honeywell TrueFRESH unit because it too is simple yet rugged and efficient.

https://forwardthinking.honeywell.com/products/ventilation/truefresh/truefresh_feature.html

**Air Filtration:**

https://www.trioniaq.com/products/index.aspx?prod=residential_Multi-Pleat

The air filters are used on all equipment that using air to heat or cool a building – in a furnace, an air handler, or a fan coil. MERV stands for medium efficiency reporting value – the higher the MERV number, the higher the filtration efficiency. However, this also means that they must get changed more frequently as they trap more dust and pollen and clog more quickly. Most mini-split units have washable air filters; most other equipment has disposable air filters.

Ultraviolet Lights:
https://forwardthinking.honeywell.com/products/uv_treatment/uv_products.html
Ultraviolets lights are very powerful disinfecting agents that can deactivate airborne and surface contaminates like mold, bacteria, and viruses. They are usually placed inside the furnace, air handler, or fan coil in a ducted air system so that all air that is circulated through the home for heating and cooling is treated and disinfected.

**Dehumidification**
Dehumidification is very important in our homes and businesses. Dehumidification provides comfort, prevents mold growth, and protects fine finishes and equipment. There are several different ways to achieve dehumidification. Typically, air to air heat pumps (mini-splits) have a "dry" mode which is a highly effective way to dehumidify. Forced air systems with air conditioning are also able to dehumidify.

**Whole House Dehumidifier:**
Another option is installing a whole-house dehumidifier. These units connect via ductwork to the air system in a house. They can be controlled by a dehumidistat which will turn the whole house dehumidifier on or off (and the blower of the air system) to maintain the humidity level desired.

We sell two brands of whole house dehumidifiers:
Carrier line (http://www.carrier.com/residential/en/us/products/indoor-air-quality/dehumidifiers/ )

Honeywell line
(http://yourhome.honeywell.com/en/products/dehumidifier)

Our goal is to be **Martha's Vineyard's premier plumbing and HVAC shop** – we appreciate the opportunity to service, install, and rescue your ***indoor air quality*** system!