

Ambient Air Filter Maintenance

Many air conditioner manufacturers include in their design an ambient air filter to protect the condenser section of the air conditioner from contaminants in the ambient air. The filter is to trap these particulate from the ambient air and prevent it from depositing onto the condenser coil, the blower and other components in the condenser section, meanwhile maintaining system cooling efficiency and increasing the life of the air conditioning system.

The filter, located at the air inlet of the condensing section, extracts contaminants from the air before the air passes over the condenser coil. This prevents deposits of the particulate from accumulating on the surface of the condenser coil, allowing the coil to maintain unimpeded heat transfer to the ambient air moved through the filter and across the condenser by the blower. The condenser can then dissipate the heat, as it was designed, in an efficient manner. This air filter also prevents deposits of particulate onto the condenser blower surfaces including the blower motor, housing and wheels. These deposits decrease the ability of the blower to move air and can lead to a reduction in overall system efficiency. The deposits can also cause the blower motor to operate at a higher temperature, or blower wheels to become unbalanced and wobble, causing accelerated wear of blower bearings and damage to the blower wheels.

A filter that is not properly maintained can lead to the many issues previously mentioned. As the filter traps the air borne particulate, the surface area of the filter that allows air to pass through it is reduced and the filter becomes more restrictive to air flow. With less air flow, the condenser coil heat transfer is compromised causing an increase in compressor power requirements, a decrease in cooling capacity and an overall loss in system efficiency.

Reduced air flow through the filter also has an impact on blower performance. The negative pressure at the blower inlet becomes lower than normal. This causes a reduced load condition that will cause the blower rotational speed to increase. This increased speed to the blower rotation may cause fatigue to the blower wheel over time due to the increased centrifugal force. This increase in speed will also typically cause a decrease in the blower motor amps as the blower is now doing less work. If the motor has a run capacitor, the decrease in motor load and amperage may also cause an increase in voltage to the capacitor which may exceed the capacitor voltage rating also leading to a premature blower operation failure. As many of these blower motors are air cooled, the reduced air flow over the motor will cause the motor operating temperature to increase leading to a premature failure.

Ice Qube recommends the ambient air filter be inspected and cleaned regularly; frequency will depend upon ambient conditions. To check the condition of the air filter, it is recommended to first remove electrical power from the Ice Qube system. Next, locate the filter cover and filter, (location will vary by model). Slide the filter from the filter rack through the end slot and clean by soaking in warm soapy water. Rinse with clean water. Use a shop-vac to remove excess water from the filter before returning it to the system. Replace the filter if it is showing signs of deterioration. A spare filter is recommended to reduce system downtime. The dirty filter can then be cleaned at more convenient time and/or location. A video providing more information regarding filter cleaning is available on the Ice Qube website. Following is a link to the video. <https://www.iceqube.com/about-ice-qube/ice-qube-tv/> Scroll down to video titled *Filter and Coil Cleaning*.