AIR Tech Note 2004-006

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Subject: Air Flow

*When Evaluating the Performance of an Evaporator or Condenser Coil it is important to take Air Flow into Consideration. Each coil requires a specific amount (cfm) of air flow for it to deliver its designed tonnage.

Common Problems Of Fans

-**All Fans Not Operational.** Unless a coil is designed to have fan staging a non-operational fan will greatly reduce the coils air flow. As an example, a four fan coil with one fan not operating will have approximately a 50% reduction in airflow through the coil. Not only have you lost the airflow from the non-operational fan but it also allows the other fans air flow to exit its fan orifice. This should be evident as the non-operational fan may be turning in the reverse direction. It may be necessary to cycle off the power to all the motors to verify this.

-**Broken Or Loose Belts**. A dual fan condenser using a common motor would be a good example. If one of the belts were off this section of the condenser has virtually no air flow.

-**Incorrect fan rotation**. This may be a sign of improper startup of the motor and the wiring must be modified to correct rotation.

Consider the environment of the coil and its overall condition.

Condensers

-**Coils Free Of Scale**. Scale may only slightly reduce the airflow but will greatly reduce the heat transfer.

-**Fan Guards/Inlet Moisture Eliminators Clean**. Condenser designs widely vary but it is important on all that the inlet air stream be clear of trash, scale and ice or frost in the winter.

-**Outlet Moisture Eliminators** Must Also Be Clear Of Trash and Free Of Scale.

-**Fan Blades Must Be Free Of Scale.**

-**Fan Orifices Must Be Free Of Scale, Ice And Frost** and the fan blade must be properly located in the fan orifice.

Evaporators

-Coils must be clean. Coils must be free of dirt and possible bacterial growth that may restrict airflow.

-Coils must be free of excessive frost.

-Coil must be free of excessive ice buildup.

-Fans must be free of excessive ice or frost. Ice may build up around the fan inlet air space limiting airflow. This will be common in a penthouse style units where a lot of humid air entering the freezer, defrosts are too long in time or too high in pressure, or if the door gaskets are in poor condition.