PREVENT®

Equipment Protection Filters

Residential Market Size:

According to the *Statistical Abstract of the United States 2008*, over 80 million households in this country have central air conditioning. As of 2006, 89% of new single family homes included central air conditioning. (See attached pages from the abstract)

According to EPA research, 0.042" of dirt on an air conditioning coil can reduce its efficiency by 21%.

An article from *RSES Journal, April 2008* ("*Unwrapping the basics of coil cleaning")* depicts what happens to a typical energy bill when coils are neglected, resulting in increased amperage draw and longer run cycles. A 5-ton A/C system operating for 1,500 hours could use as much as 37% more power if the coils are dirty. With a kWh cost of $0.12 and it costing $90 more per ton to run the system with dirty coils, the owner could spend up to $450 more to operate the system for those 1,500 hours (roughly 2 months).

Will this filter hurt the air conditioner?

No – it simply makes it easier to clean and prevents debris from getting embedded behind the protective louvers where you may not see it and know the unit is clogged.

Materials: A 4 ton outdoor condensing unit with matched air handler, indoor coil and line set was purchased on the open market and shipped directly to Underwriters Laboratories, Plano, TX

Tests were run on a clean unit and repeated with a PreVent single layer filter surrounding the unit to determine what change in unit performance might occur.

Method: ARI Standard 210-240-2006 Performance Rating of Unitary Air Conditioning and Air Source Heat Pump Equipment.

Results: Independent testing showed that attaching a PreVent® Equipment Protection Filter caused less than 1% change in Compressor Discharge Pressure.

Method: Additional test runs were completed, adding samples of a 6 denier polyester fiber to the running unit, to simulate debris loading on the unit. The fiber was chosen to represent a known fiber size, frequently used in air filter manufacture, which would allow air to flow past. It was not the intent of this test to completely block the unit, just to verify the type of changes that occur as debris loads and air flow is diminished.

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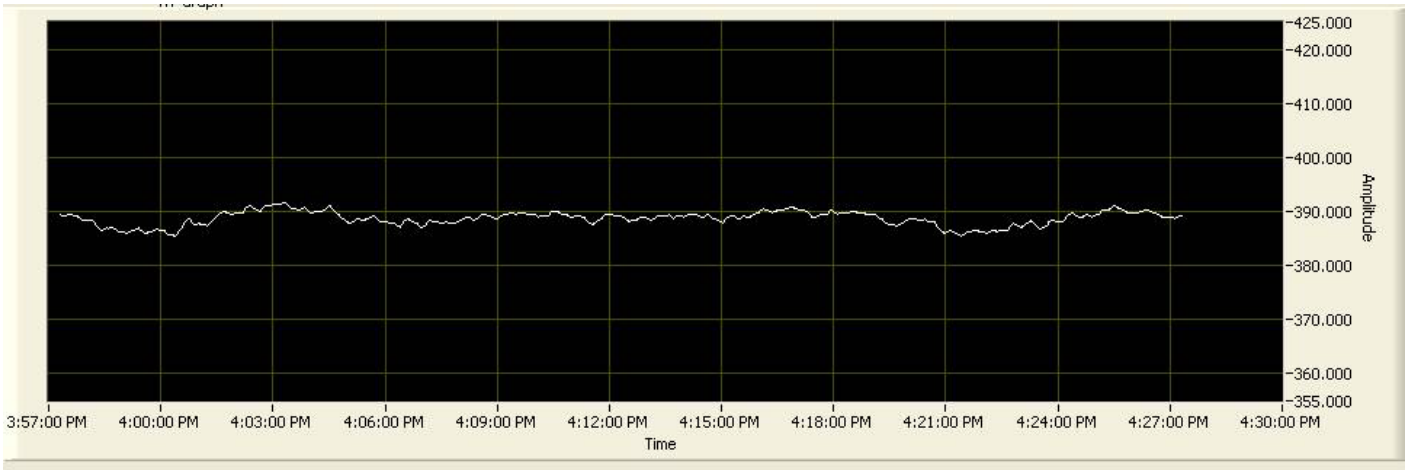
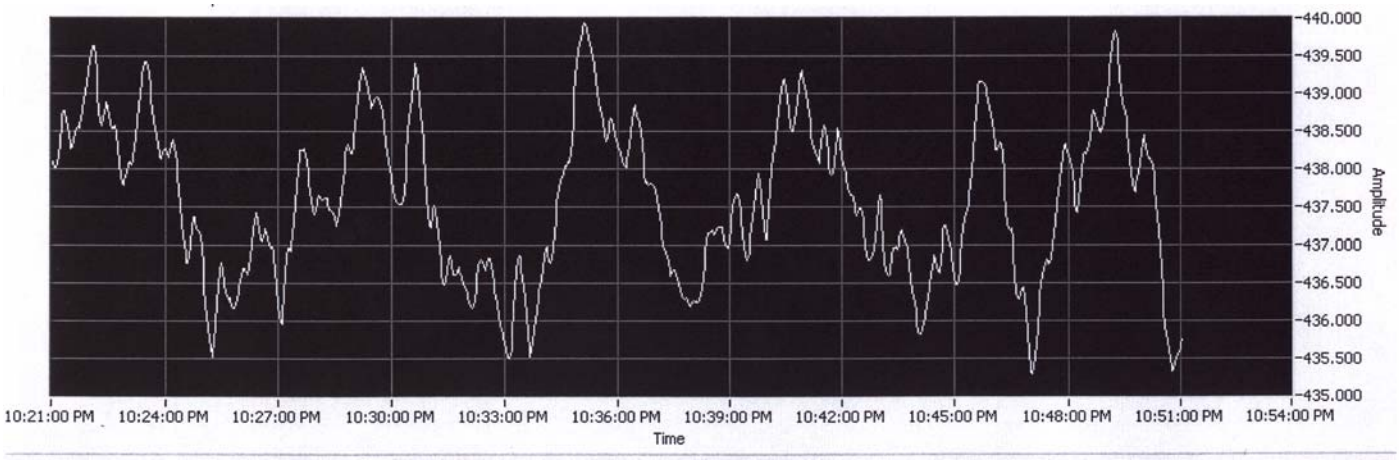
Results: As anticipated, head pressure increased, as did energy consumption. Real time graphic shots help visualize the strain in unit operation which results in the increased pressures and energy consumption





Dirty coils produce higher discharge pressure. When the higher pressure hits the valve that controls the flow of refrigerant, which in turn keeps the temperature at the prescribed set point or "superheat" for that system, a stable temperature can no longer be easily reached. As a result, the valve opens and closes while trying to maintain system temperature and this produces the fluctuating pressures that you see on the graph above. Thus the unit loses stability and performs less efficiently. Without cleaning, a unit will eventually shut down when a set pressure is reached.