Many of you would like to test AircoFridge Optimizer to either prove to yourself or your customer that it does what it says it does. With over 25 years of history in manufacturing (Oils and Lubricants), testing, data discovery and various applications, we believe we do exactly what AircoFridge Optimizer was formulated for. We understand there are skeptics and that you may not be able to overcome their doubts without testing, as AircoFridge Optimizer is not always an easy sale. This bulletin is to inform you how to go about these tests and what equipment would be eligible for testing.

Before we get started, let's go over exactly how AFO works in an air conditioning and refrigeration system and how it achieves energy savings. This will help you understand how the testing procedures perform.

As most of you have viewed the video of the lubricity test, AFO has savings on friction reduction. This is a small amount of savings. Most of the savings comes from restored heat exchange.

There is oil in the air conditioning and refrigeration systems to lubricate the compressor. The compressor in the system is there to do just that, it compresses refrigerant throughout your system. As the compressor pushes the refrigerant out, a small amount of oil that is there to lubricate will get pushed out with the refrigerant.

Science tells us that everything has a positive or a negative charge. Your refrigerant lines (Freon lines) have a positive charge and the oil and refrigerant have a negative charge. Over time the oil is going to migrate out to the refrigerant lines and build layer upon layer, more importantly in the heat exchangers. Oil is a fantastic insulator and therefore will impede your heat exchange. This is why when your system is new it is operating at its highest efficiency and as years go by that efficiency is decreased. Because AFO has a higher negative charge than the manufacturer's refrigerant oil, it is going to go in and attach in a one molecule layer on the refrigerant lines and the oil will return back to the compressor where it should be. This is going to restore the heat exchange back to what it was when it was new. With the restored heat exchange you are going to be able to blow colder air therefore satisfy the thermostat sooner and the unit will not have to run as long to perform the same work. Again, this is where most of the savings are achieved.

First, you should choose the right system to perform the test on. Not all systems would be eligible for good reason. Examples of some systems that are ***NOT*** eligible are listed as follows with their reasons:

- An air conditioning system that controls a warehouse area, or other area where there are multiple systems that condition that space. A good example is a Home Depot that may have 20 roof top units. The reasoning behind this is that if you treat just one roof top unit, the savings will not be seen because the other 19 all use the same thermostat. They will all reach the same goal at the same time and thus you cannot see the improvement of the treated unit.

- Any systems that are controlled by a humidistat. A humidistat will cause the a/c system to operate even when the thermostat is satisfied because the humidity levels have increased. You will see these types of systems in sensitive computer or electronics areas. The savings can be seen here, but only after several months and comparisons to similar conditioned times of the year.

- An air conditioning system or refrigeration system that has multiple compressors on a rack system and you want to only treat one of the compressors. They share common oil and refrigerant and since we recommend going in at a 5-10% of oil capacity, you are diminishing the amount of AFO and not installing enough for performance. The AFO will migrate to the other compressors in the rack system and then you have a very small portion of AFO in all the compressors. It will not be enough AFO to show any savings. ***You must treat all of the compressors on the rack system***.

- A refrigeration system that is an open reach in cooler. These are typically found in grocery stores and convenience stores. The reasoning behind this is that if you treat the open reach in, you are essentially assisting the air conditioning system as well. The cooler will produce colder supply temperatures, but will be lost to the open air and assist that room's air conditioning system in reaching its set temperature.

- An undersized air conditioning system. This may take place when a business has grown and has not added additional cooling for the new heat loads. The reasoning behind this is that no matter what you do to that system, it is going to run constantly to try and reach the desired temperature. You may get cooler air coming out, but it will still run constantly as it was not designed for the larger area.

- A lead/lag air conditioning refrigeration system. The reasoning behind this is that the way the system is engineered. For example: the lead/lag system has three compressors. The system is set to run compressor number 1 all of the time. If the unit calls for additional air conditioning compressor number 2 will start up. And if even more air conditioning is called for compressor number 3 will then start. Normally not all three compressors are used, but when the system is operating at capacity. If the system is a lead/lag you will need to monitor all of the compressors in the lead/lag system.

- A unit whose thermostat can be changed by any employee. This is most commonly seen when there are cold secretaries that will adjust the thermostat when the boss leaves for a meeting and where the boss in a suit will drop it back down when he arrives.

The best scenario for a AFO test on a system would be to locate one that is a "stand alone" system that does not share common oil or refrigerant with other systems. This would be a system that controls one area and has its own thermostat and does not have other systems that cool the same conditioned space. Also, it is important to know that the unit is running properly.

Another scenario is to have two side by side units that are under the same conditions and cooling the same type of area. For example, two roof top units that are cooling different office spaces. I t is a good idea to treat several units with AFO and have several as a control. This will ensure that we did not encounter any fluke readings on the extreme positive or negative side of the savings.

With any test that you would like to perform we highly recommend contacting AFO at 1-855-GO-G4ALL.

Now that you have located the correct system, let's go through the testing parameters:

- Submit Audit form to AFO to verify the proper amount and blend to install.

- Acquire data loggers to record the data for the test. We recommend Hobo Data Loggers (which can be purchased from Onset Computer Corp. (800) 564-4377, http://www.onsetcomp.com/products/data-loggers). Onset has people to assist you in choosing the right data logger for your specific test.

- Once you have the loggers, you will begin monitoring. The most important things to monitor will be:
    - Run Time
    - Supply Temperature (temperature coming out of the supply vent)
    - KWH or amps

- Other things to monitor can be:
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    - Internal Pressures
    - Head Temperatures
    - Sound or Decibel Levels
    - Vibration
    - Delta T - this is the temperature difference between the return air temperature (air before evaporator) and supply air temperature (air after the evaporator).

- You will set the logger to monitor every 1-5 minutes.

- You will monitor at least one week prior to installing AFO.

- Once the AFO has been installed, you will monitor 2-3 weeks after. Results may be seen that same day, but to get the full picture it is best to see the averaged savings.