


raise
RESTORE
1030 

An explanation of how RESTORE1030™
Improves the efficiency of Air Conditioning
and Refrigeration Systems

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What is RESTORE1030™?

RESTORE1030™ is a patent pending technology that differs from any other product on the market. It is a second generation product made specifically to address efficiency in Air Conditioning and Refrigeration Units.

- RESTORE1030™ requires a one-time only injection for all systems.
- RESTORE1030™ is compatible with all present compressor lubricating oils and Freon.
- RESTORE1030™ has third party testing that shows compatibility with all AC and Refrigeration components.
- RESTORE1030™ contains no chlorinated or sulphonated compounds.
- RESTORE1030™ is environmentally friendly

How Does RESTORE1030™ Improve Efficiency?

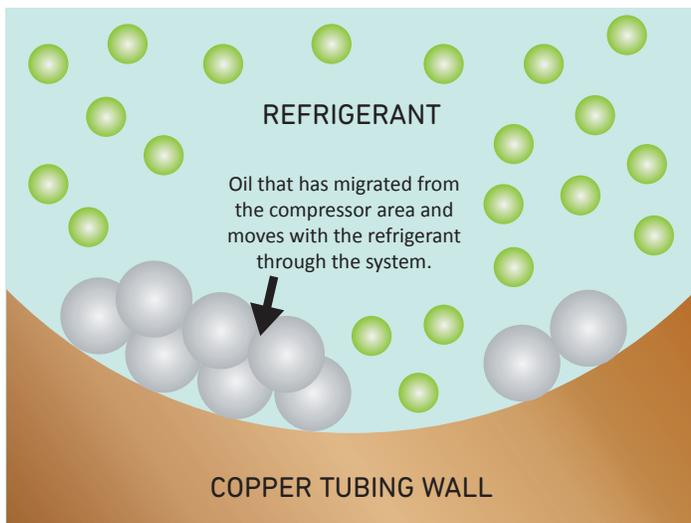
The efficiency issues that are addressed are :

- Oil Fouling
- Amp Draw
- Startup Amp Spikes
- Refrigerant Flow
- Heat Transfer
- Pool Boiling

Oil Fouling:

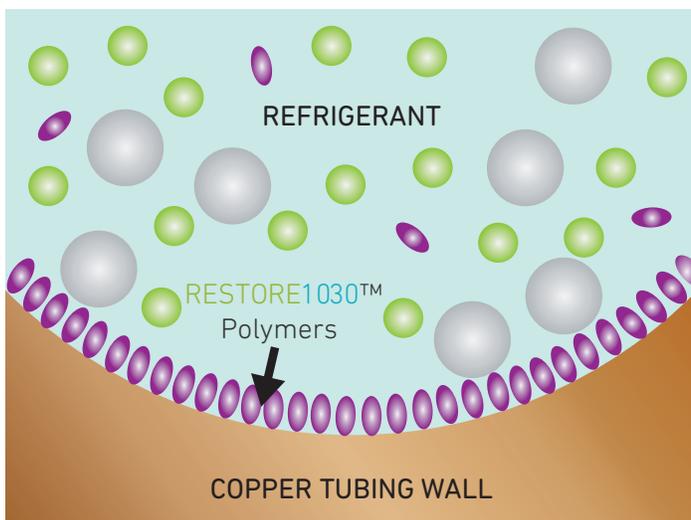
- Refrigeration systems with mechanical compressors circulate 1-5% of their compressor lubricating oil with the refrigerant that is circulated throughout the system.
- Recirculating oil over time forms a sticky, lacquer-like substance, which fills the pores of the copper tubing carrying the refrigerant to and from the evaporator and condenser, over and over again during the refrigeration cycle.
- Due to the insulating properties of oil, the oil insulates the heat transfer to the metal tubing walls impeding heat exchange.
- Oil fouling degrades system performance by up to 30%*.
- All compressor oils available today cause some degree of Oil Fouling, impeding heat exchange.

* ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Experts)



Before Treatment:

Some lubricating oil migrates from the compressor and mixes with the refrigerant. This oil travels through the entire air conditioning system where it attaches itself to the metal surfaces on the inside of the heat exchanger coils. This has the effect of insulating them and the end result is the reduced ability to transfer heat because of increased friction. More total energy is then needed to circulate the refrigerant throughout the system, resulting in reduced efficiency and greater run times.



After Treatment:

RESTORE1030™ dislodges this layer of non conductive oil and will continue to protect to prevent future build up. This allows for better refrigerant flow due to reduced friction, greater heat transfer, greater overall performance and reduced run times.

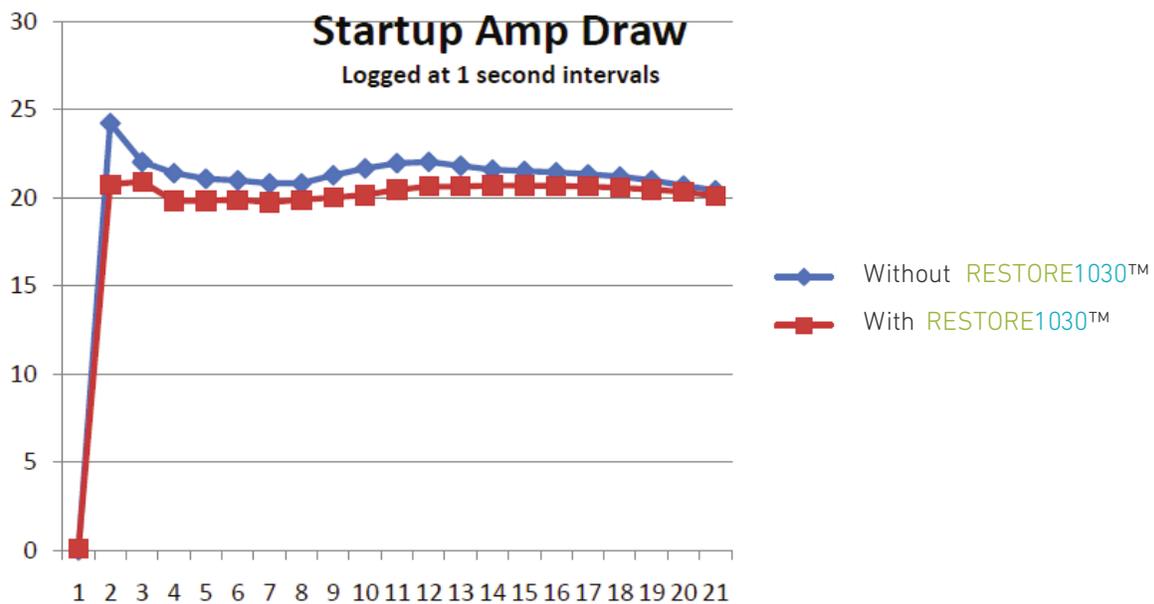
- **RESTORE1030™** technology removes and eliminates Oil Fouling on refrigeration tubing inner surfaces; acting as a catalyst without chemically changing itself, the refrigerant, or the lubricating oil.
- This process allows the **RESTORE1030™** polymer to permanently bond to the metal surfaces eliminating future Oil Fouling and improving heat exchange.

Amp Draw:

- **RESTORE1030™** reduces the operating amperage draw of the compressor by reducing friction on the components of the compressor and improving heat exchange.
- **RESTORE1030™** allows the compressor to operate at a lower temperature and pressure.
- **RESTORE1030™** reduces compressor noise level by 3-5 decibels.

Startup Amp Spike:

The addition of **RESTORE1030™** virtually eliminates the amp spike that occurs when the compressor starts. This is important because the majority (80%) of the wear occurs during the compressor startup. Significantly reducing the spike will add to the longevity of the compressor and reduce the amps required to start the compressor.



Refrigerant Flow:

Introduction of **RESTORE1030™** to a system will increase refrigerant flow by 5-8%.

Increased refrigerant flow increases unit capacity improving heat transfer and efficiency.

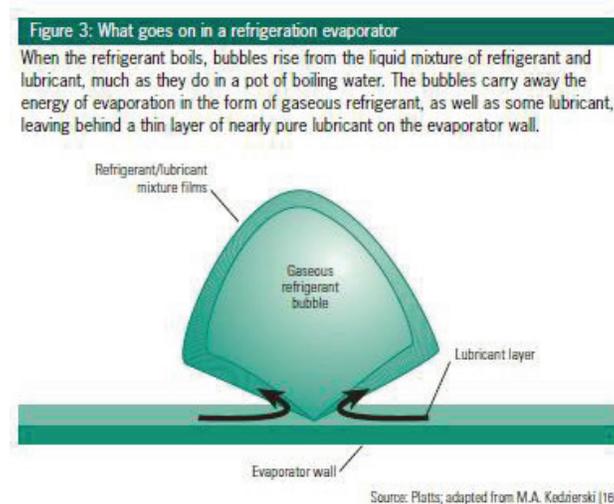
Heat Transfer:



Air Conditioning and Refrigeration is all about the transfer of heat and reduction of humidity.

RESTORE1030™ improves the heat transfer process by:

- Removing Oil Fouling
- Bonding a polymer to the metal tubing and parts to improve heat transfer
- Increasing refrigerant flow



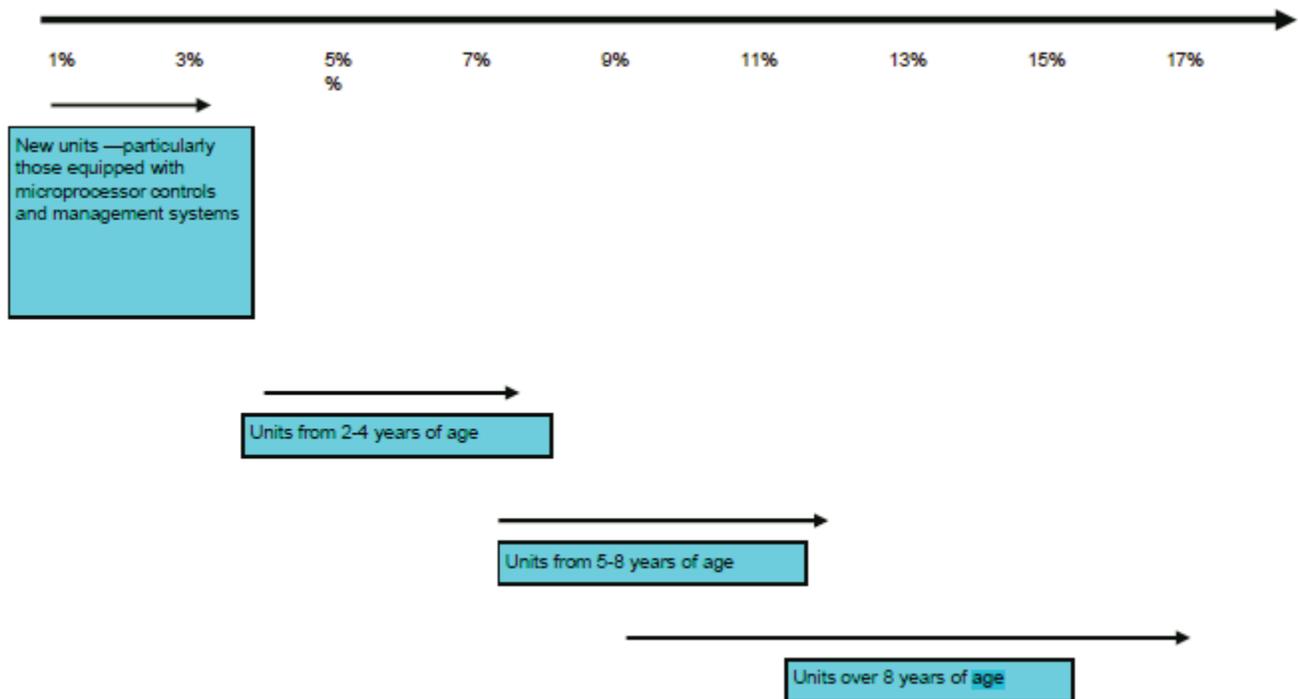
Pool Boiling for the purpose of this discussion is the point in the evaporator where the liquid Freon begins to change to a vapor state. As the pressure drops, the liquid Freon begins to form tiny bubbles similar to what you can observe as you boil water. The bubbles start small and then get larger as the process of vaporization continues. It is the Pool Boiling and vaporization process that reduces the temperature of the evaporator coil and allows heat transfer from the air flowing through the coil to the Freon inside.

There are many factors that effect the pool boiling within the evaporator. Aside from pressure and temperature there are studies indicating that the lubricity of lubricating oil and the quantity within the evaporator also effect pool boiling. In the case of **RESTORE1030™**, ETL testing indicates the annular flow extends deeper into the evaporator coil to allow for better heat transfer.

We make no claims as to the causal relationships that allow **RESTORE1030™** to lower the temperature of the supply air and reduce the relative humidity.

RESTORE1030™ Product Expectations:

Efficiency Increase:



RESTORE1030™ Cost Savings:

Cost savings are generated from the following formula:
 $\text{Efficiency Increase} \times \text{Operating Hours} \times \text{Cost per KWH}$

What is important to note here is that only the efficiency increase is attributable to **RESTORE1030™**. As part of the efficiency increase there will be a reduction in operating hours necessary for the unit to fulfill the requirements.

There are other issues that contribute to cost savings that are not included in the efficiency increase:

- **RESTORE1030™** Reduces future repairs — compressor life likely lasts longer due to decreased amp draw and start up spikes
- **RESTORE1030™** Eliminates Oil Fouling forever — the unit will continue to operate at the improved efficiency for the remainder of the units' useful life.

ROI

By using the cost savings model and knowing the installation cost, it is possible to produce an estimated Return on Investment for installing **RESTORE1030™**. Typical AC installations will produce an ROI of less than 12 months while Refrigeration installations will be considerably less than one year. Heat pumps are considerably less than one year because the benefits are accrued on both the heating and cooling cycles.

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