

By EnSaTEQ, Inc.

The Advanced Polarized Refrigerant Oil Additive (PROA) for Air Conditioning, Freezers, Coolers, Chillers, Ice Machines, Vehicles, Refrigerated Trucking and Warehousing

The Only Product Originally Formulated to be a Polarized Refrigerant Oil Additive (PROA)

Treating air conditioning, heat pump and refrigeration systems with a PROA has been proven in the laboratory and by customer use to reduce power consumption by 20 to 30 %. **PROATEQ** improves the "Q" Factor, the physics term for heat transfer, in the condenser and evaporator coils in these systems, resulting in substantial savings.

The energy cost savings realized by the addition of **PROATEQ** will, in most applications, recover the investment in one year or less. The savings and performance improvements will continue for the life of the system.

PROVEN BENEFITS

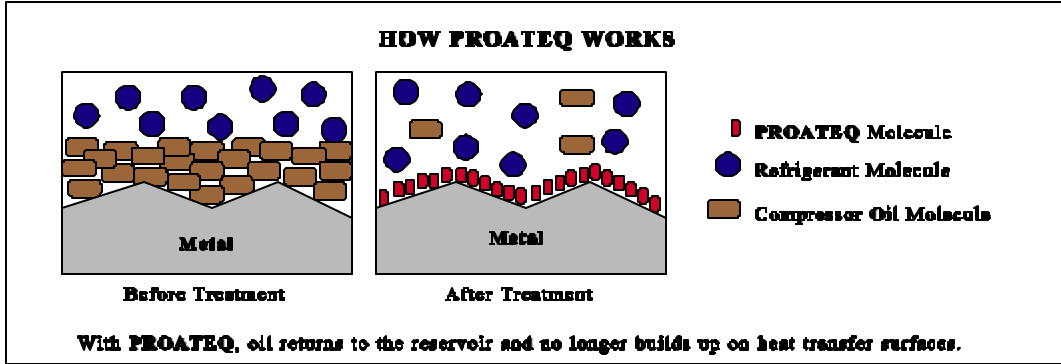
- 칠 **PROATEQ** helps achieve and maintain a high level of system performance.
- 칠 **PROATEQ** improves heat transfer ("Q" Factor).
- 칠 **PROATEQ** extends compressor system life.
- 칠 **PROATEQ** cleans and restores older systems.
- 칠 **PROATEQ** contains an acid scavenger that blocks acids from causing compressor burn out.
- 칠 **PROATEQ** reduces friction noise, and vibration.
- 칠 **PROATEQ** reduces system cycle time (shorter run times, longer off times).
- 칠 **PROATEQ** prevents bearing gall with anti-weld and anti-seize additives.
- 칠 **PROATEQ** reduces energy necessary to produce a ton of refrigeration.
- 칠 **PROATEQ** improves systems rapidly.
- 칠 **PROATEQ** protects the environment by reducing energy consumption.
- 칠 **PROATEQ** contains no potentially acid-forming chlorinated or halogenated oils.
- 칠 **PROATEQ** contains no system-clogging gummy paraffin or olefin waxes.
- 칠 **PROATEQ** poses no serious health or safety risks.
- 칠 **PROATEQ** contains no hazardous materials.
- 칠 **PROATEQ** softens, conditions, and extends life of seals.
- 칠 **PROATEQ** increases lubricating capability of compressor oils.

COMPRESSOR SYSTEMS

Air conditioning, heat pump, and refrigeration systems function by relying on the energy absorbed or released as a compressible fluid undergoes either pressure increase in a compressor or pressure decrease across a valve or other orifice. Typically, these systems transport heat by the phase changes of the gas compressed to the liquid state, and the liquid state expansion to a gaseous state. There is an evaporator coil on one side of a compressor taking up heat (-Q), and a condenser coil on the other side of the compressor giving off heat (+Q). Such compressor systems are used either for refrigeration and air conditioning or for climate control of buildings and homes.

HOW PROATEQ WORKS

PROATEQ contains a highly polar molecule that works synergistically with compressor oil to improve the performance of air conditioning and refrigeration systems by increasing the heat transfer, “Q”, capability. In an air conditioning or refrigeration system, the refrigerant flows from the compressor through the condenser and evaporator cores, which are the system’s heat exchangers. A small amount of compressor oil is carried along with the refrigerant. This oil deposits and forms an insulative barrier on the interior surfaces of the heat exchangers. This insulation inhibits heat transfer, “Q”, and reduces the system’s operating efficiency. **PROATEQ** takes advantage of this problem of compressor oil escaping out into the system. Using a low viscosity non-particulate base oil for faster migration of polarized molecules, **PROATEQ** electrostatically bonds to the interior surfaces of the evaporator and condenser coils. The highly polar **PROATEQ**



molecule first displaces the unwanted build-up of compressor oil. The **PROATEQ** process then replaces the old thermally insulative layer of compressor oil with a highly thermally conductive film of **PROATEQ** one

molecule thick. The high polar charge of the **PROATEQ** molecule attracts the refrigerant to the surfaces of the heat exchangers, resulting in accelerated heat transfer, “Q”. This, in turn, reduces compressor cycle time (shorter run times and longer off times), thus reducing the energy consumed to maintain the same environmental temperature.

SYSTEM BENEFITS

Lubrication:

In most systems there will be times when the refrigerant thins the oil to a point where the lubricant will no longer protect the compressor. Compressor oils, as well as compressor lubrication systems, generally provide poor bearing lubrication at each compressor start-up. **PROATEQ** forms a molecular film on compressor bearings, protecting the compressor at the start-up of each cycle, when the oil has drained from the load-bearing surfaces.

PROATEQ does not drain from compressor surfaces. **PROATEQ** is not removed by filtration, as are standard lubricants, mechanical lubricants, or solid particle lubricants. **PROATEQ** continues to protect the system, even when temperature and stress have caused conventional lubricants to become useless. In addition, **PROATEQ** helps prevent welding (galling) and bearing seize-up during high stress operating periods, with an anti-gall/anti-weld additive.

PROATEQ bonds to the metal and greatly increases the lubricity of compressor oils. Because of the increased lubricity with **PROATEQ**, compressor oils will last longer in your compressor. In large systems where oil changes are periodically required, **PROATEQ** can extend the life of the oil and the time between changes. This can reduce annual maintenance costs.

Thermal and Oxidation Stability:

PROATEQ contains a thermal and oxidation stabilizer for the lubricating oil mixture, greatly increasing the compressor's chance for long-term survival. **PROATEQ** greatly improves the compressor oil's ability to resist to oxidation and corrosion.

Color and Heat Stabilizer:

PROATEQ contains an oil color and heat stabilizer. This allows **PROATEQ** to protect your compressor oil from chemically breaking down at temperatures above 300 degrees F.

Rapid System Improvement:

PROATEQ benefits are quickly demonstrable--within 20-30 minutes in small systems such as cars, within one to two weeks in most larger systems in business or industrial applications. It is common to see an increase in cooling efficiency, indicated by a decrease in energy consumption and a noticeably cooler temperature at the duct outlet.

Acid Scavenger:

Compressor systems are very sensitive to acids. Acid formation occurs when moisture combines with chlorine or one of the other halogens that are parts of compounds that break down inside the compressor due to heat or stress. The free acids attack the windings on the compressor motor or attack the compressor bearing surfaces causing compressor burn-out. **PROATEQ** contains no chlorinated or halogenated compounds that could potentially break down and form damaging acids. What **PROATEQ** does contain is an acid scavenger that finds and ties-up free acids if they occur in a system, rendering them harmless to the sensitive components in the compressor.

Results:

All the components of **PROATEQ** will help extend the equipment life and reduce maintenance costs. Installation of **PROATEQ** in your system provides the most technologically advanced lubricant on the market today. **PROATEQ** protects the compressor's oil from breaking down by including a thermal and oxidation stabilizer and a color and heat stabilizer. **PROATEQ** reduces noise and vibration caused by friction and will literally clean and restore older systems. **PROATEQ** contains an acid scavenger that blocks acids from causing compressor burn out. **PROATEQ** acts rapidly and will continue to protect for the life of your compressor.

COMPATIBILITY WITH REFRIGERANTS AND COMPRESSOR OILS

PROATEQ is compatible with the following refrigerants:

GROUP 1

- R-11 Trichlorofluoromethane
- R-12 Dichlorodifluoromethane
- R-13B Bromtrifluoromethane
- R-22 Chlorodifluoromethane
- R-113 Trichlorotrifluoroethane
- R-114 Trichlorotetrafluoroethane
- R-502 Chlorodifluoroethane
- R-744 Carbon Dioxide

GROUP 2

- R-40 Methyl Chloride
- R-717 Ammonia
- R-764 Sulfur Dioxide

GROUP 3

- R-290 Propane

In addition to the above list of older refrigerants, **PROATEQ** is also compatible with all of the new alternative refrigerants, including R134a. Many of the new alternative refrigerants lack the efficiencies of the restricted refrigerants. **PROATEQ** can help increase and maintain efficiency in systems using the new refrigerants.

PROATEQ is compatible with all compressor oils without any special reformulation. Currently, four chemical types of compressor oils are available. They consist of mineral oil base, polyalkylene glycol (PAG), ester base, and alkylbenzenes. **PROATEQ** is formulated with coupling agents which effectively stabilize the molecule in all four oil types. There is no need

for special formulations with synthetic oils and no danger of high viscosity reaction products forming.

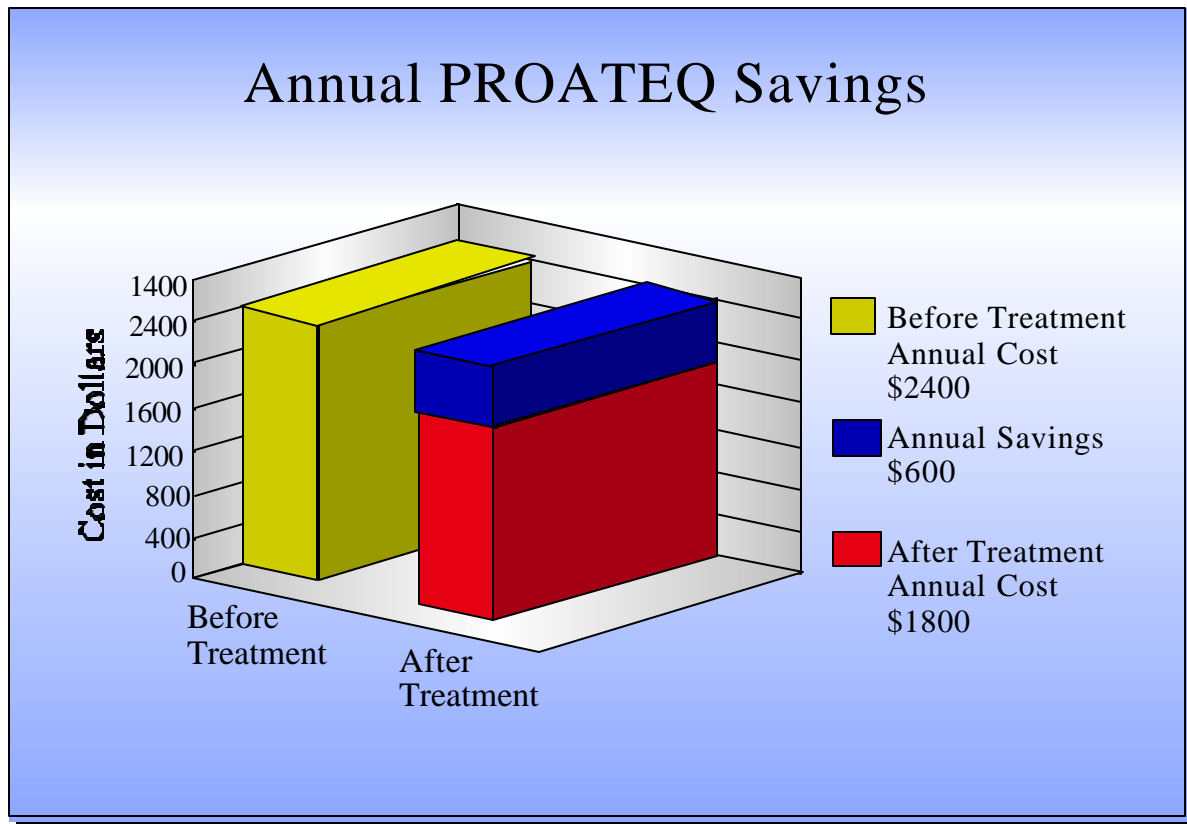
INSTALLATION

PROATEQ is simple and inexpensive to install. **PROATEQ** is normally installed in the low-pressure side of a compressor system, using one fluid ounce per ton of air conditioning (12,000 BTU) in systems smaller than ten tons. Units larger than ten tons generally require about 10% of the oil capacity. This is dependent on the make and type of unit and must be evaluated on an individual basis. In order to expedite the PROA action of **PROATEQ**, a portion of the recommended treatment quantity of the product can be injected safely into the high pressure side of the system. This will reduce the time the PROA usually takes to reach the evaporator core.

The oil in large commercial and industrial compressors must be changed on a periodic basis. If it becomes necessary to change the oil in your compressor, it is unnecessary to completely re-treat with **PROATEQ**. Add only a reduced amount of the original treatment quantity, usually from 10-50% of the original volume of **PROATEQ** used, determined by the type of compressor. This will assure that the system will continue to have the full benefit of **PROATEQ** protection.

If it becomes necessary to reclaim the refrigerant, there is no need to re-treat with **PROATEQ**. The polarized particles bond to the interior metallic surfaces of the compressor, evaporator, and condenser. The remaining beneficial components in **PROATEQ**, such as the acid scavengers and the thermal and oxidation stabilizer, are suspended in the compressor oil and will still be in the system after the refrigerant is reclaimed.

FINANCIAL BENEFITS



NOTE: Data is based on the following assumptions

- ❏ 5 ton unit @ \$40/ton/month = \$200 month utility bill before treatment
- ❏ **PROATEQ** provides 25% average annual savings

PROATEQ will decrease the cost of operating air conditioning, heat pump, and refrigeration systems. Annual savings from the use of **PROATEQ** will help meet company goals of energy savings and overhead reduction. The investment in **PROATEQ** can usually be recaptured in three business quarters. The following typical annual return on investment (ROI) figures are based on the graphics data on the 5-ton compressor with an assumed cost of \$0.11 per kWh.

- ❏ The \$600 annual savings, with only a \$300 **PROATEQ** investment yields a 200% annual ROI
(600 / 300 = 2.0 x 100 = 200%).
- ❏ Over five years at \$600 per year, the savings equals \$3,000.
- ❏ A \$3,000 savings over five years with only a \$300 **PROATEQ** investment yields a 1000% ROI.
(3,000 / 300 = 10.0 x 100 = 1000%)

Large systems such as chillers will produce a much greater ROI. A typical 700-ton chiller will contain about 15 gallons of compressor oil, and require only 192 oz. of **PROATEQ**, or 10% of the compressor oil volume. These assumptions, based on an assumed cost of \$0.11 per kWh, yield the following results:

- ❏ Before **PROATEQ**, a 700-ton system will cost about \$26 per ton per month to operate. The monthly utility cost will be about \$18,200.
- ❏ After **PROATEQ**, the projected 25% savings will reduce the utility cost about \$4,550 per month.
- ❏ The \$4,550 monthly savings over 12 months will result in a \$54,600 annual savings.
- ❏ The \$54,600 annual savings with a \$11,520 **PROATEQ** investment yields a 474% annual ROI.
- ❏ The \$273,000 over five years with a \$11,520 **PROATEQ** investment yields an 2370% ROI.

Larger systems may realize savings that recapture the investment in as little as one business quarter. These figures do not include a service charge for installation or sales tax if applicable. Utility tax savings, energy savings rebates, savings on maintenance, and savings on the extension of compressor life are not included in these figures because they are difficult to project without company specific data. These additional savings will increase the ROI considerably.

Note: Data is based on the above information for a 700-ton unit

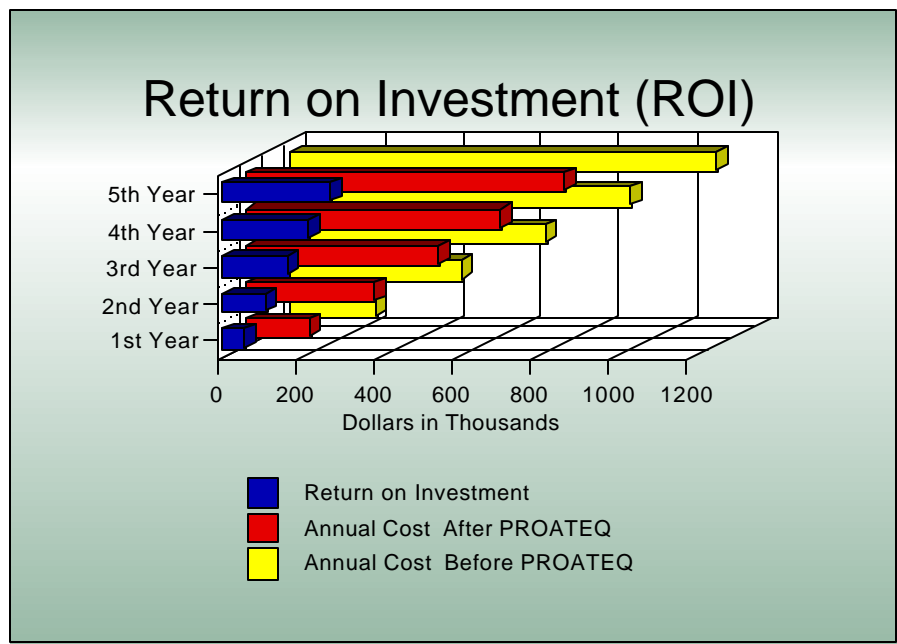
ENVIRONMENTAL FRIENDLINESS

Extensive laboratory and field testing has found that **PROATEQ** does not put any additional restraints on waste oil recyclability or waste oil disposal. **PROATEQ** contains no environmentally hazardous or toxic materials, such as chlorinated or halogenated oil products. A federally compliant Material Safety Data Sheet (MSDS) is on file with each **PROATEQ** dealer.

HEALTH AND SAFETY

PROATEQ poses no serious health or safety risks. There are no known carcinogens or toxins in **PROATEQ**. Tests on similar materials suggest that no eye effect is to be expected. Tests on similar materials indicate that no significant adverse health effects are expected to occur with short term exposure to skin. When ingested or inhaled, tests on similar materials indicate no acute effects are to be expected. There are no noted medical conditions aggravated by exposure.

PROATEQ is a slightly combustible liquid, OSHA-NFPA Class IIIB. If heated above its flash point of 360 degrees F, **PROATEQ** will release flammable vapors which can burn in open air or be explosive in a confined space if exposed to an ignition source.



PROATEQ can be safely handled using good common health and safety precautions.

LIMITED FIVE YEAR WARRANTY

PROATEQ has been formulated and manufactured by **EnSaTEQ, Inc.**, to provide a high level of trouble-free performance.

EnSaTEQ, Inc., embodies many years of experience in formulation of industrial lubricants, and many years of experience in high-tech manufacturing and customer service. **EnSaTEQ, Inc.**, sells its products only through a network of authorized dealers. Only **PROATEQ** purchased from one of our authorized dealers is covered by the terms of this warranty.

EnSaTEQ, Inc., warrants **PROATEQ** to be free from defects in material and workmanship. When **PROATEQ** is properly installed, **EnSaTEQ, Inc.**, will repair or replace any compressor system proved to be damaged solely by the product. This warranty shall extend for a period of five (5) years from the date of purchase to the original purchaser/end-user only, and is not assignable or transferable. If the Installer fails to follow the proper **EnSaTEQ, Inc.**, recommended installation procedure, this warranty will be void. This warranty is limited to actual damage to treated equipment, and does not include incidental or consequential damages or damages of any other kind or character. This warranty shall not apply to any product that has been subject to misuse, abuse, mishandling, tampering, spillage, contamination during or after shipment, or any defects or damage caused by improper handling or storage.

PROATEQ AND EQUIPMENT WARRANTIES

PROATEQ meets or exceeds all major equipment manufacturers' warranty standards for compressor oils. The Magnusson-Moss Consumer Product Warranty Act of 1992 prohibits compressor manufacturers from voiding their warranties because of the addition of third party oil additives, unless that equipment manufacturer can prove that the lubricant harmed the equipment. **EnSaTEQ, Inc.**, is confident that there is absolutely nothing in **PROATEQ** that can harm the equipment.

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