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*NON-CHEMICAL , ENVIRONMENTALLY GREEN  
FLUIDS TREATMENT FOR WATER AND DIESEL FUELS*

## **Descal-A-Matic Water and Fuel Saver Technology**

### **The “Why” and “How” it Works**

Descal-A-Matic technology uses powerful magnetic influence fields to affect the water or hydrocarbon fuel passing through the device. The magnets used in our technology are made of powerful, permanent magnetic alloys, developed during WWII specifically with permanency in mind. They do not lose strength, or “wear out” over time, as many magnets in use today will do. We have Descal-A-Matic technology applications providing the same service today as the day they were installed, some 40 years ago.

While the power of magnetic influence has been known and studied for many years, it is often misunderstood. In 1969, Ernie Florestano, Founder and President of Descal-A-Matic began a design improvement effort on magnetic technology available at that time, and spent the next seven years perfecting his unit design to what Descal-A-Matic is today. Design issues such as; magnetic strength, flow velocity and residence time, Magni-Core and outer housing material makeup, and optimum passage space drove the final design. Units afford maximum influence for varied flow requirement applications.

Magnetic influence works at the molecular level. Descal-A-Matic technology uses alternating magnetic fields through which water or hydrocarbon fuel passes, and during which time the molecules of dissolved minerals in water, or hydrocarbon molecules making up diesel fuel are affected. This process does not deposit anything into the water or fuel passing through the device, nor does it remove anything from water or fuel, except ferrous particles. The only items found in water that are removed are those ferrous particles; such as iron, that may be resident in the water systems. Fuel systems are generally filtered enough to remove such particles prior to the Fuel Saver unit.

Descal-A-Matic units have no moving parts, save the fluid flowing through the magnetic fields. Our units are manufactured with Permanent Magnets made of an alloy developed during World War II for the sole purpose of not losing magnetic strength over time. Due to this fact Descal-A-Matic / Fuel Saver units last, literally, forever. The initial purchase cost is the only cost. Return on Investment generally runs 12 months or less.

## **Water System Applications:**

Descal-A-Matic unit magnetic influence has an effect on the dissolved mineral molecules within water and not the water molecules themselves. Water contains calcium, magnesium and other divalent cations that, when heated, form insoluble compounds with anions such as carbonate. On heat transfer surfaces this carbonate compound impedes heat transfer, acting as an insulator. As this insulating carbonate builds up the amount of energy required to transfer equivalent heat energy, increases dramatically.

- **Effective Sizing of Units.** Effective sizing of units to particular applications is dependent upon knowing a number of characteristics of the application:
  - Once Thru vs Re-circulating Systems; if the system is a “once through” application the maximum flow rate needs to be known. If it is a re-circulating type system, smaller units sized to treat the entire volume of water held within the system, in one hour, can be used.
  - Maximum Pump Capacity. For systems using circulation pumps the maximum flow rate capacity needs to be accounted for in sizing units.
  - Water Analysis. A number of items pertaining to condition of the source water need to be known and accounted for. Most water analysis reports typically give more information than is needed, but these are required:
    - pH. Starting point pH needs to be known. Descal-A-Matic use will normally lead to a pH of between 7.2 – 7.6.
    - Total Dissolved Solids. TDS as reported in Parts Per Million (PPM) is needed.
    - Hardness. Water hardness as defined by CaCO<sub>3</sub> determined in Parts Per Million. Water hardness above 60 ppm (3.5 grains) is considered “hard” and that above 342 ppm (or 20 Grains) is considered “extremely hard.” Extremely hard water will call for using an oversized unit. Water with hardness below 20 grains normally requires a straight forward sizing based upon flow requirements.
    - Iron. Most water sources contain some degree of iron as defined as FE 203. Descal-A-Matic units will generally sequester .5 ppm iron but for applications having greater amounts of iron, we recommend use of an iron filter device. Ferrous particles like iron will attach onto the Magni-Core and need to be cleaned off of the core at least once per year.
    - Silica. Silica as defined as SiO<sub>2</sub> in Parts Per Million. Slight to moderate Silica content can be handled by Descal-A-Matic units. High Silica content will cause problems for the unit.

- **Installation.** As there are many varied type applications we will address the major type applications made of Descal-A-Matic.
  - Chilled Water HVAC Systems. Descal-A-Matic units can be affixed within the Cooling Tower system on a re-circulating basis to treat the volume of water within the entire system on one-hour intervals. An additional unit can be placed on the feed water line to treat makeup water as its added to the system. Use of Descal-A-Matic units along with supplemental Copper/Silver IONization systems and Automatic Bleed Valves have proven a best fit for most applications.
  - Boiler Systems. Descal-A-Matic units can be placed on the feed water line to the boiler system, as this water is generally below 200 degrees F. We do not treat steam lines directly. Also, water temperatures above 400 degrees F. will damage the Descal-A-Matic unit.
  - Kitchen/Laundry/Medical Facilities. Facilities having a number of water use appliances/equipment can either have Descal-A-Matic units located on the water feed line to the individual unit, or more preferably, installed into the main water feed line to the facility. Located in the main water line, all downstream equipment is treated by a single Descal-A-Matic unit.

Any water handling system will benefit from installation of Descal-A-Matic technology, with the exception of those using distilled water. Descal-A-Matic has provided this technology to many thousands of end-users covering a wide range of applications.

- **How It Works.** Again, Descal-A-Matic units influence the dissolved minerals molecules contained within the water column. Other suspended particulates (debris of many types) are not affected by Descal-A-Matic units and would need to be filtered out.
  - Per the findings of Drexel University study on Physical Water Treatment (PWT) devices, in which a Descal-A-Matic 1-gpm unit was one of three type units evaluated;
 

“The PWT produces a bulk precipitation in water. As the solubility of treated water decreases inside heat transfer equipment, the tiny particulates produced by the PWT grow in size, thus preventing crystallization fouling.”
  - The accumulation and flocculation of mineral IONs as “soft sludge” forms a thin coating on surfaces including heat exchange surfaces, piping, etc, where it is easily removed by water flow velocity within heat exchangers or during normal “blow down” flushing cycles. The thin layer of “mud” does not have a detrimental effect on heat transfer and it does prevent corrosion from occurring on these same surfaces.