HYDROMX®
Energy Saving Solution

HYDROMX FAQ:

WHAT IS HYDROMX?

Hydromx is an energy-saving nanofluid. Hydromx uses Nano-Thermol® technology to evenly suspend nanoparticulate in a glycol-based solution. As a result, Hydromx significantly improves the heat transfer of closed-loop hydronic heating and cooling equipment. Hydromx has been verified by utilities and third parties to reduce power consumption by 20-35%.

WHAT IS A NANOFLUID?

A nanofluid is a fluid containing stably suspended nanoparticles with dimensions smaller than 100 nanometers (one billionth of a meter). The term “nanofluid” was first used by Choi (1995) to describe this new class of nanotechnology-based heat transfer fluids with enhanced thermal properties. In the past 10 years, the US Government has co-authored patents on two different nanofluids.

HOW DOES A NANOFLUID LIKE HYDROMX IMPROVE HEAT TRANSFER?

All HVAC systems consist of multiple heat exchangers. It has been academically proven that, during heat transfer, nanofluids increase the “active surface area” of the heat transfer fluid. As a result, the efficiency of the overall system improves as if the heat exchangers have become theoretically larger.

Nanofluids increase the active surface area of the medium by evenly suspending nanoparticles.

HOW DOES HYDROMX SAVE ENERGY AND MONEY, AND REDUCE CARBON EMISSIONS?

Reports from Argonne National Labs in 1997 describe early nanofluid research as a perceived increase in the surface area of the heat transfer fluid. Hydromx operates in a similar fashion as its Nano-Thermol technology delivers a perceived increase of the surface area of a fluid beyond the surface area of the fluid in contact with the heat exchanger.

Hydromx improves the heat transfer of the entire fluid to the heat exchanger wall. The fluid in the center of the pipe improves its thermal conduction to the heat exchanger wall.

As a result, HVAC systems that operate with Hydromx require less energy consumption to achieve the same performance when compared to the same system running on water or a water/glycol blend. By improving the system efficiency, Hydromx reduces power consumption, saves money, and reduces carbon emissions into the atmosphere.

HOW DOES HYDROMX VERIFY ITS 20-35% ENERGY SAVINGS?

Hydromx has been thoroughly reviewed by an independent panel with NSF sponsorship to generate both a Life Cycle Analysis Report and an Environmental Product Declaration Report.

These reports state "...when compared to inhibited water, the net benefits of Hydromx are greater than 26% for any impact category, while benefits approach 36% compared to a propylene glycol-based HTF." These reports also document the resulting carbon emissions reduction to satisfy many government codes and mandates.

WHAT IS HYDROMX MADE FROM?

Hydromx is available in two glycol formulations: ethylene (Hydromx "Red") and propylene (Hydromx "Blue."). Hydromx also includes the energy-saving, non-abrasive, non-toxic, nanomaterial along with corrosion and biological inhibitors.

HOW DOES HYDROMX VERIFY IT IS NON-TOXIC?

Hydromx is certified nontoxic by FDA regulations. Both Hydromx's ethylene and propylene versions carry the highest available safety rating from NSF for toxicity. Hydromx-EG (ethylene) carries an NSF HT-2 rating. Hydromx-PG (propylene) has an NSF HT-1 rating. Documentation of these ratings can be found at nsf.com (search for "Hydromx.")

HOW IS HYDROMX INSTALLED?

The existing heat transfer fluid in a closed-loop system is drained and replaced with Hydromx. One pipefitter can complete installation in usually one to two days.

Hydromx will arrive on-site in concentrate to be mixed with tap water per Hydromx's installation instructions. Hydromx challenges the industry to identify another energy-saving product that is as fast and easy to install with similar energy-saving benefits.

HOW LONG HAS HYDROMX BEEN ON THE MARKET?

Over 15 years. After three years of development, Hydromx was first installed in 2008 at a NATO airbase in the mountains of Turkey to enhance the performance of a hangar heating system. The 2500-gallon installation was completed in one day and resulted in 35% energy savings with a less than two-year ROI.

India was one of the first big markets for Hydromx. Over 100 installations of Hydromx have produced between 20-35% energy savings in cooling, heating, and process applications.

The first installation in the United States was in 2015 in the server rooms of the HBO broadcast center in Hauppauge, New York. The building experienced 27% energy savings and 90% more free-cooling hours. The 65,000 kWh annual savings resulted in a one-year ROI.

Among its numerous case studies, Hydromx is the only approved heat transfer fluid in the Empire State Building in Manhattan. It is currently running in multiple loops throughout the building and is under consideration to be installed in all Empire State Buildings loops by 2024.

WHERE IS HYDROMX MANUFACTURED?

New York, USA.

DOES HYDROMX OFFER A WARRANTY?

Hydromx comes with a 20-year limited warranty. In addition, Hydromx carries a $10 million liability policy per project and the policy has never received a claim.

DOES HYDROMX OFFER ANY BENEFITS BESIDES INCREASED THERMAL EFFICIENCY?

Hydromx is a glycol-based efficient heat transfer fluid and thus offers complete system protection from corrosion, scaling, calcification, algae, freezing and bursting.

IF A PROJECT IS IN A WARM CLIMATE, WHY WOULD ONE WANT TO USE HYDROMX AS IT IS MOSTLY "GLYCOL"?

Simply stated, Hydromx outperforms water. The industry is used to glycols needing a "derate" as they do not perform as well as water. Nanofluids are changing this perspective as they are glycols that outperform water.

Hydromx believes the new term for "uprate™" needs to be used to better explain its performance over water. When much of the US was subjected to a polar vortex in February 2020, many facilities that used water for heat transfer froze their HVAC components. Replacing the water with Hydromx would be a simple solution to offer freeze protection while increasing efficiency.

CAN HYDROMX BE USED TO REPLACE A WATER LOOP THAT IS DRAINED AND FILLED ANNUALLY?

Yes, Hydromx is a perfect solution for these outdated systems. Draining and filling water loops is labor-intensive, increases corrosion potential, and dumps toxic inhibitors down the drain into water treatment plants.

CAN HYDROMX CONTRIBUTE TO LEED CERTIFICATION?

The LCA and EPD have verified that Hydromx contributes to the new LEED v.4 standards in three categories: Optimizing Energy Performance, Building Lifecycle Impact Reduction, and Building Product Disclosure and Optimization.

WHAT DOES HYDROMX COST?

Hydromx usually costs 2–3 times greater than traditional glycol. With Hydromx's energy savings, the price difference comes with a payback that is usually around three years.

In addition, Hydromx has received utility rebates to help pay for this energy-saving solution. One such rebate resulted in a negative 0.24-year payback, as the rebate was greater than the cost of the Hydromx fluid.

WHAT IS HYDROMX'S SPECIFIC HEAT?

While this is a common engineering question, it is also a misapplied question for nanofluids. Specific heat is measured with the fluid static. HVAC systems operate with the fluid in motion and better yet, the fluid in turbulence. Nanofluids outperform other fluids when in turbulence.

Also, some nanofluids (including Hydromx) are non-Newtonian which means their characteristics change under stress. Hydromx is a sheer-thinning nanofluid where its fluid pressure drop improves as it is placed under stress.

