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KEEPING COOL IN DATA CENTERS

That's a lot of energy!

Data centers use 3% of the world's total electricity, roughly 416 terawatts - that's nearly 40% more than the entire United Kingdom! According to this Forbes article, this energy consumption will double every four years.

This energy consumption is used throughout the plant in IT, facilities and day-to-day operations. The facilities portion will focus on cooling the servers and hardware that stores data and information. With all of this energy, a massive amount of heat is produced. Servers and heat do not mix well - in fact, too much heat around a server and it's components will cause the equipment to run slowly, incorrectly and ultimately destroy it.

A common way to cool data centers and keep them running efficiently is by utilizing cooling towers and chillers.

However, just like servers, this equipment needs preventative maintenance and upkeep. One of the main culprits is scale build up on the cooling tower fill and the chiller tubes.

What is a cooling tower's purpose?

The basic principal of a cooling tower is to cool the water that has picked up heat generated by equipment within the facility such as chiller and AC equipment. The operation begins in the tower basin where the cooled water is pumped into the facility and utilized for cooling the chillers. As the equipment is cooled, the water picks up the heat and returns to the top of the cooling tower. The hot water is distributed onto a hot deck or through sprayer nozzles that evenly distribute it over the tower fill media. This encourages evaporation and cooling of the water. Water then falls into the basin where the cycle repeats

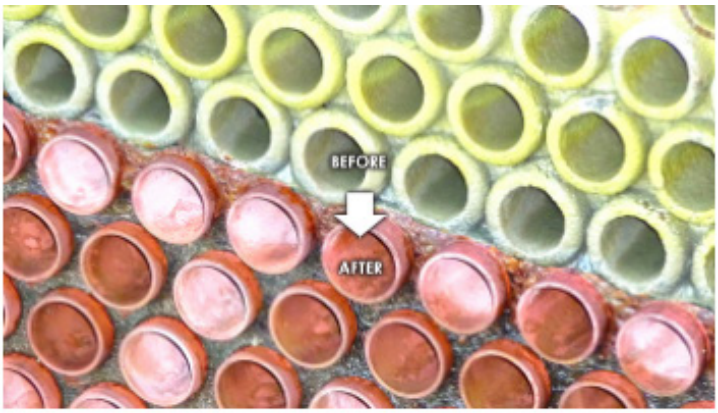
Scaling with a cooling tower can restrict the water distribution spray nozzles, reduce the water flow through the openings of a hot deck and restrict the airflow with the tower. All of these conditions will result in diminished cooling capacity and inefficient operation of the associated equipment on the cooling tower system. Scale accumulation is detrimental in data centers as it can cause servers to overheat which leads to downtime and revenue loss.

Maintenance with *RYDLYME*

RYDLYME is an excellent choice for cleaning water formed deposits from chillers. ***RYDLYME***, will help you rid your equipment of scale deposits and have them working at top efficiency in just hours.

Whenever there is a deposit of any type on a heat transfer surface, it retards heat transfer. This is referred to as "thermal resistance" and it requires a corresponding increase in energy to overcome it. Major manufacturers of air conditioning equipment generally design chillers to operate at a maximum "thermal resistance" or "fouling factor" of 0.0005. As a result, with only 0.036 inches (about 1/32") of deposit corresponds to an increase in energy costs of over 30%!

Cooling tower before & after ***RYDLYME*** chemical descaler



Chiller before & after ***RYDLYME*** chemical descaler

This 30% increase in costs relates to a hardness scale (calcium carbonate) deposit. Iron deposits (same thickness) are greater insulators and therefore have lower heat transfer coefficients. The actual heat transfer coefficient of a fouling/deposit (scale, lime, corrosion products, dirt, silt) depends on what it is. Certainly, any fouling/deposit contributing a fouling factor (thermal resistance) will increase electrical consumption and decrease efficiency.

The increase in electrical energy takes place in the compressor. Scale deposits increase the resistance to heat transfer, and in the condenser higher refrigerant gas temperatures will result. Higher refrigerant gas temperatures mean higher gas pressures, which require greater energy to compress the refrigerant. Therefore, there is an increase in electrical power to operate the compressor. Data centers already use an enormous amount of energy, preventative maintenance on equipment such as chillers will greatly reduce the amount of energy required to operate a chiller's compressor due to the removal of scale on the water side of the chiller tubes.

To minimize such potential energy losses requires an ongoing, daily monitoring of KW consumed per ton of refrigerant/air conditioning being generated. The purpose is to recognize inefficient operation and determine where the problem is and fix it. Each day of inefficient operation means excess energy expenditures. Fortunately, ***RYDLYME*** dissolves the toughest water-formed deposits from virtually any type of water heated, cooled or operated equipment.

COST SAVINGS EXAMPLE

EQUIPMENT	KW/ TON	LOAD FACTOR	OPERATING HOURS	KWH/ RATE	ENERGY COST
500 TON CHILLER	x .65	x 100%	x 6,570	$ .09	= $192,173

DEPOSIT THICKNESS (INCHES)	% EFFICIENCY LOSS	INCREASED ENERGY COST
0.01	9%	$17,296
0.02	18%	$34,609
0.03	27%	$51,887
0.04	36%	$69,182
0.05	45%	$86,478

Just 1/32 of an inch of scale can add nearly $52,000 to the cost of operating a 500-ton chiller!

ENERGY SAVINGS 0.03" DEPOSIT	CHEMICAL CLEANING COST (EST.)	ANNUAL NET SAVINGS
$51,887	$900	$50,987

This cost savings example shows the increased energy costs associated with scale deposits. Utilizing the layout in this chart, reference your own equipment, what your facility pays for power and your equipment operating hours. Once you've ascertained your yearly operating costs, add the correlating percentage based on your current scale thickness. Now ask yourself, "Can I afford not to do a ***RYDLYME*** cleaning"?

BIODEGRADABLE HEAVY DUTY DEGREASER

INDUSTRIAL STRENGTH DEGREASER

VOC COMPLIANT

pH NEUTRAL

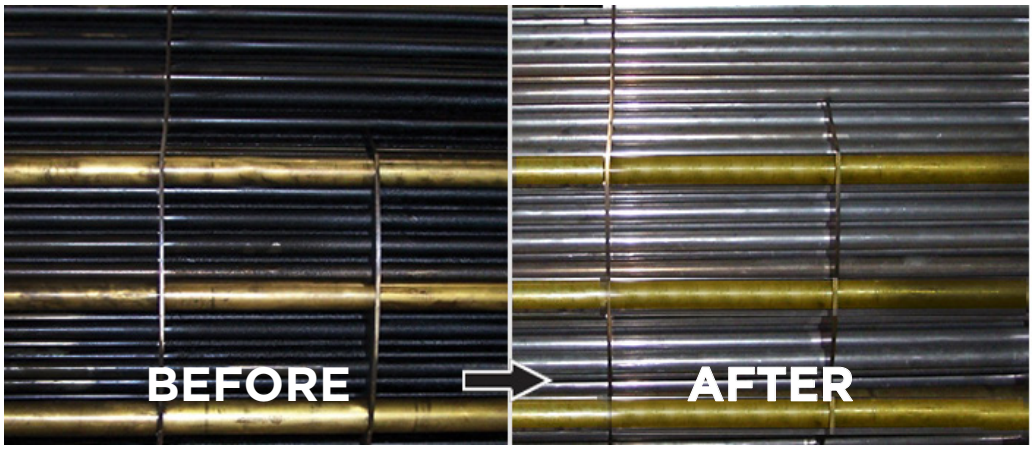
NON HAZARDOUS

RYDALL HD is our new biodegradable, non-hazardous, citrus based, **H**eavy-**D**uty industrial degreaser. It is a water soluble, non-butyl, non-phosphate, non-corrosive, emulsifier. This innovative product is used specifically on hydrocarbon based derivatives that are found on the oil or process side of equipment, simply by circulating through or spraying on the equipment. ***RYDALL HD*** heavy duty industrial degreaser, may be utilized among many applications including:

- Plate heat exchangers
- Rig wash
- Tube bundles
- Oil coolers
- and other grease contaminated equipment

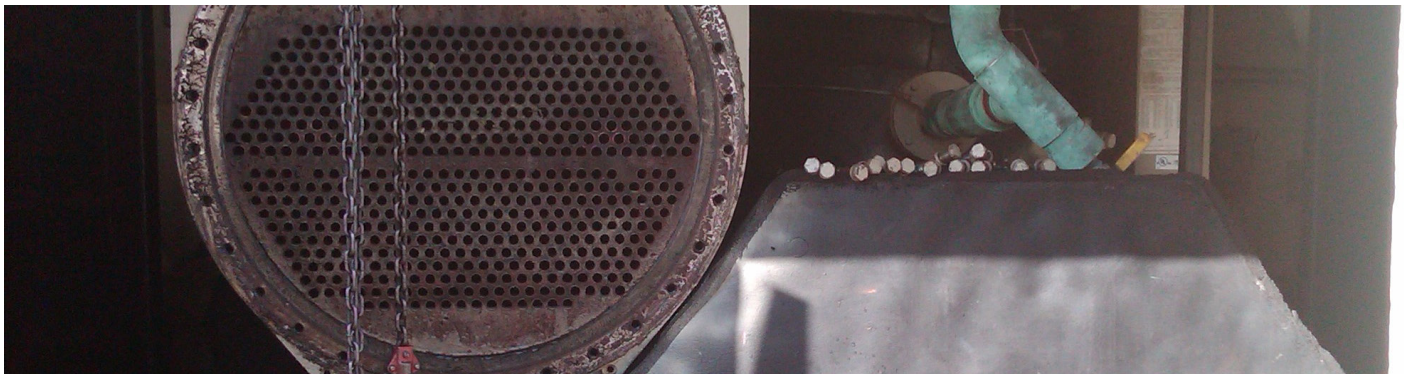
This equipment can be found in numerous industries including:

- Petrochemical
- Metal
- Automotive
- Utility
- Beverage
- or similar industries



FINANCIAL INSTITUTION CHILLER CLEANING

A large financial institution was having serious issues with water scale deposits which had accumulated in their 600 ton chiller. Approach temperature per the chiller's design specification was 3°F. This value had skyrocketed to upwards of 12°F and reduced the chiller's capacity to barely 80%. However, while operating at this level the approach temperature was still two degrees above normal. Previously, the chiller had been cleaned with harsh acids which had corroded the walls of the copper tubes in the condenser. This prohibited further use of corrosive acids to clean the system. A senior technician fortunately remembered using ***RYDLYME*** at his previous casino operation and immediately contacted Apex Engineering Products to facilitate a solution as soon as possible.



FOUL TERRITORY

A whimsical concoction of information in the world of scale, grease, odors and more.

A foul smelling supermarket should be closed until the issue has been dealt with according to it's shoppers.

Complaints from patrons have ranged from having to leave the building before they became sick and that they would rather starve than purchase food from the store.

Environmental health has located the source of the odor and traced it back to stagnant water sitting under the floor.

The grocery store said that they were having an issue with their pipes which posed no risk or harm to their customers.

The supermarket has apologized and has said that they are working on fixing this issue ASAP!

RYDALL OE would cure these odor issues from the water.

RYDALL OE is an environmentally beneficial additive to grease traps, dumpsters, ponds & lagoons!

For more information on eliminating odors, please visit our website at

www.**ApexEngineeringProducts**.com

story via http://bbc.com/

DESCALER & PUMPING SYSTEMS

RYDLYME biodegradable descaler is specifically designed to dissolve the toughest water scale, lime scale, mud and rust deposits from virtually any piece of water-based equipment. **ANSI 60/NSF-Certified Nonfood Compounds (A3)**.

RYDLYME Pumping Systems are specifically designed to circulate ***RYDLYME*** through a vast array of equipment and systems keeping your facility in peak operating condition.

CLEANERS & DEGREASERS

RYDALL CC Coil Cleaner is a biodegradable coil cleaner specifically designed to clean dirt, grease and soil residue from air-exposed surfaces of critical cooling or heating equipment. **NSF-Certified**.

RYDALL MP Multi Purpose Degreaser is a biodegradable, highly concentrated degreaser/cleaner that quickly and safely removes oil, grease, grime and other pollutants from all surfaces and components. **NSF-Certified**.

RYDALL HD Heavy Duty Degreaser is a biodegradable, heavy-duty degreaser used specifically on all carbon-based derivatives found on the oil and/or process side of your equipment or system.

RYDALL VP Specialized Degreaser is a biodegradable, pH neutral degreaser specifically designed to safely and quickly clean and degas refinery process equipment. It can be applied in circulation or vapor phase applications.

RYDALL DC Deodorizing Cleaner is a biodegradable, ultra-concentrated product that vitalizes microorganisms already present on surfaces and help speed up their metabolic process to naturally rid surfaces of odor and disease-causing bacteria.

ODOR CONTROL & WATER TREATMENT

RYDALL OE Odor Eliminator is a unique, environmentally beneficial biocatalyst containing a complex mixture of natural nutrients, vitamins, and trace elements designed to eliminate industrial odors and corrosion problems.

RYDALL WO Water Optimizer is an environmentally beneficial additive that disallows the formation of H_2S, COD, BOD, FOG, TDS and TSS. This unique biocatalyst is also effective in enhancing methane production and O_2 content.

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*For 75 years, Apex Engineering Products has been formulating and manufacturing safe and biodegradable specialty cleaning chemicals for a diverse range of applications around the world. From our **RYDLYME** biodegradable descaler to our versatile **RYDALL** line of cleaners and degreasers, our products will decrease downtime and increase efficiency.*

We are a fourth-generation, family-owned company renowned not only for our biodegradable line of products, but also our in-depth and exceptional customer support. With decades of knowledge and experience in a wide array of applications, our knowledgeable technicians will work closely with you to determine the best solution for your facility's unique challenges. To further minimize your downtime, virtually all orders are shipped out within 24 hours.

*Apex Engineering Products also takes great pride in being an ISO 9001 Certified Company providing the highest level of support and quality of products to our customers…**another formula that hasn't changed in over 75 years!***

Made in the USA