mechanicalservicecorporation

TECH TALK

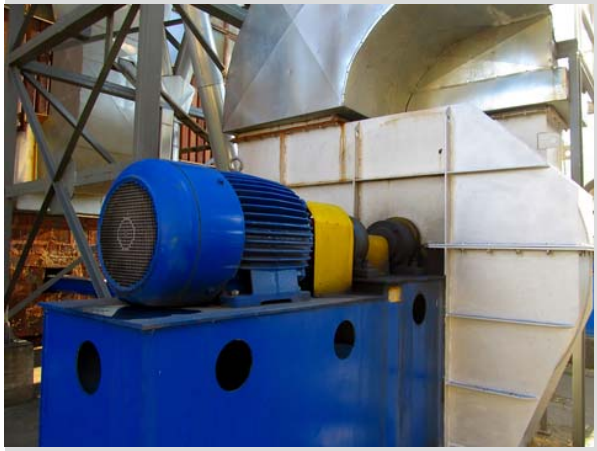
MSC - THE ONLY TRUE HVAC SERVICE COMPANY - WE FIX IT

NEWSLETTER - JULY 2016

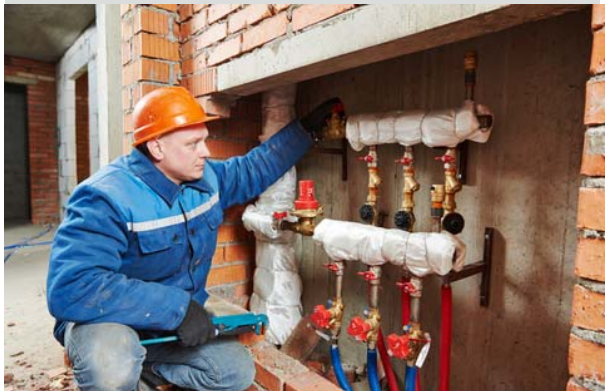
973-884-5000

SERVICE CALLS

Second Opinion - A large three-phase process exhaust fan was overheating and shutting down, creating big problems for a manufacturing company. A contractor prescribed costly replacement of the fan and motor, but the facility manager was unconvinced and called MSC for a second opinion. MSC traced the problem to a three-phase breaker that had lost one of its phases, thus overheating the motor's stator core. The breaker was replaced and the fan was back in operation within hours.



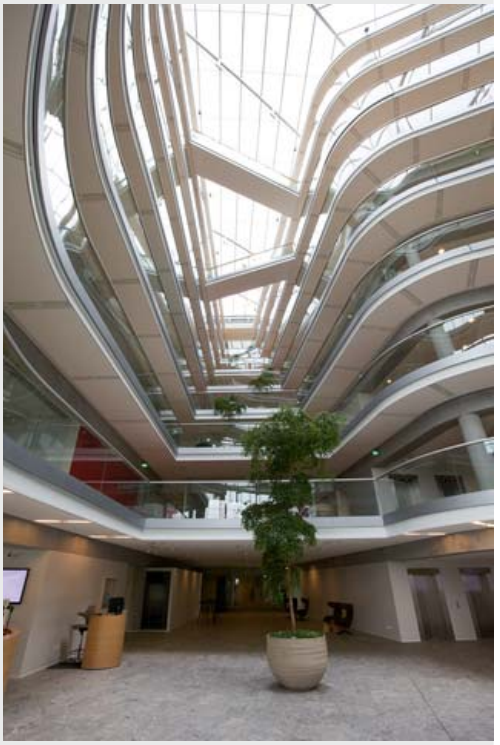
Mechanical Equipment Evaluation - A real estate and engineering design firm hired MSC to evaluate mechanical equipment at a building that was being purchased. MSC provided a comprehensive evaluation that included the age, model and serial numbers of all equipment, the caliber of maintenance performed, level of function for each piece of equipment, and detailed recommendations for improvements in order to apprise the buyer of the true condition of the facility.



THERMAL STRATIFICATION

Stratification can be defined as a condition that occurs when two or more airstreams remain separated in layers. This layering of air can lead to troublesome and costly problems in air handling units and in building spaces.

In air handling units, inadequate velocity can result in return air and fresh air remaining in two separate layers of differing temperatures. This condition usually happens in winter and can cause nuisance freeze stat tripping, frozen coils, poor temperature control accuracy, insufficient fresh air distribution, poor economizer operation, and uneven velocity profile. To remedy forced air stratification issues, a detailed temperature and velocity profile should be performed by a system design professional to identify the cause of the stratification. Identified issues can be remedied with the addition of strategically placed baffles, dampers, and other blending devices.



Thermal stratification naturally occurs in all buildings when hot air rises and heavier cool air falls to the floor. Heat buildup in ceilings and roof areas, particularly in buildings with high ceilings, can result in extreme temperature differences - as much as 50°F - between floor and ceiling. HVAC systems must over-compensate with constant cycling of either heating or cooling to maintain set temperatures. This issue can usually be corrected with an efficient destratification fan system to circulate air layers and equalize air temperatures, which can reduce energy consumption by as much as 50%.

INSIDE...

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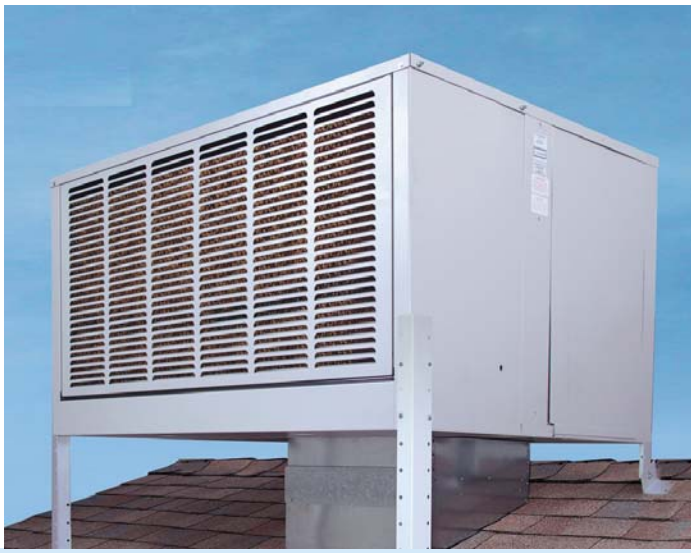
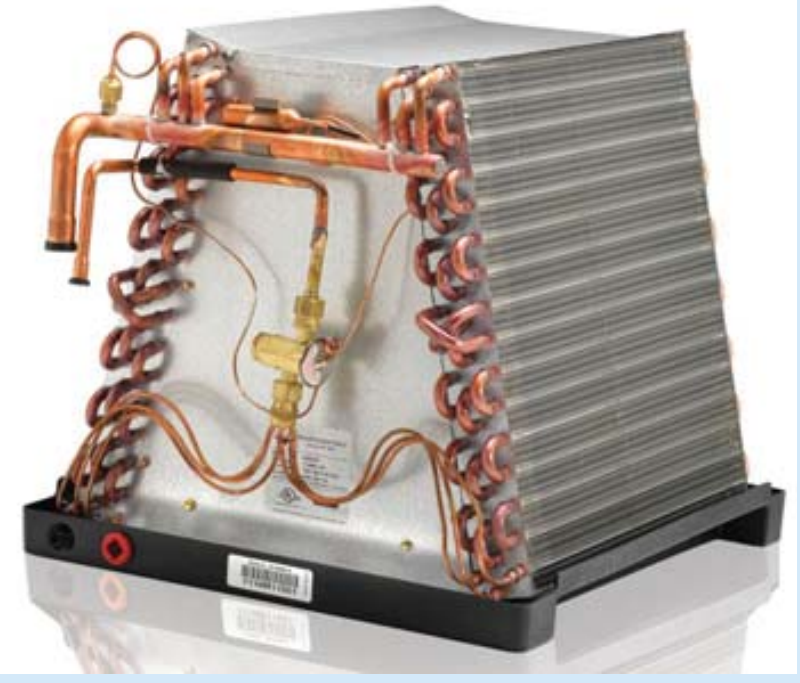
EVAPORATIVE COOLING

When we think of summer cooling here in the muggy northeast, the mere thought of adding more humidity to the air is enough to cause one to break out in a sweat. But in climates where relative humidity is low, cooling the air through water evaporation is a popular and highly efficient alternative to traditional air conditioning systems.

The most basic example of evaporative cooling is perspiration, in which evaporated sweat absorbs heat and cools the body. An evaporative cooler, or swamp cooler, uses the same principle – warm outside air is drawn through a membrane that is continually saturated with circulated water, and evaporation cools the air. There are two main types of evaporative cooling, direct and indirect. Direct evaporative cooling changes warm, dry air to cool, moist air, while indirect evaporative cooling incorporates a heat exchanger to transfer cool energy produced by the direct evaporative process to the supply air. Some systems combine direct and indirect evaporative cooling, while others use a combination of evaporative and vapor compression cooling.



Evaporative cooling in warm, dry climates can be far superior to traditional methods, using up to 80% less energy. It can be used in certain applications in more humid environments, but traditional cooling methods typically outperform evaporative cooling in these climates.



WHAT'S IN A COIL by Pete McGrath

Are all replacement coils created equal? Hardly.

When a chilled water, hot water, steam, DX, or condenser coil requires replacement, most HVAC contractors are apt to follow the same course: 1) call the manufacturer, 2) give the unit model and serial number, and 3) install the OEM coil that is sent.

MSC, on the other hand, will rarely furnish and install an OEM refrigeration coil. This is because most OEM coils are competitively bid out to the cheapest vendor, who keep costs down by skimping on the materials. Of course, the thinner the copper tube gauge and the thinner the fin, the flimsier the coil, and the greater the likelihood it will fail prematurely. MSC has seen many of these flimsy factory coils fail while still fairly new, oftentimes leaking at the tube sheet where the copper tubes pass through the sheet metal to the coil header.

As the leading HVAC service specialist in the northeast, it is MSC's duty to make sure every job is done right, not just go along with what all the other contractors are doing. Our technicians take precise coil measurements in the field and specify dimensions, gauge, and number of rows to a coil when ordering replacements. This approach typically costs a bit more, but it ensures a better-quality end product that is more rugged, performs better and lasts longer than its OEM counterpart. When turnaround is an issue, most can be manufactured and shipped in a matter of days.

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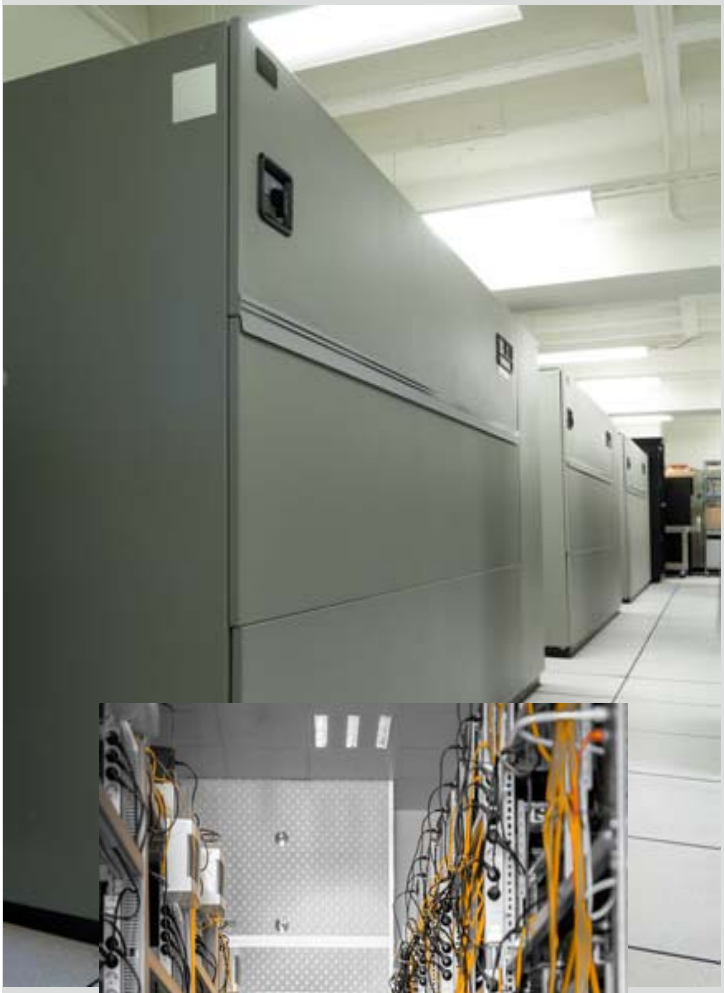
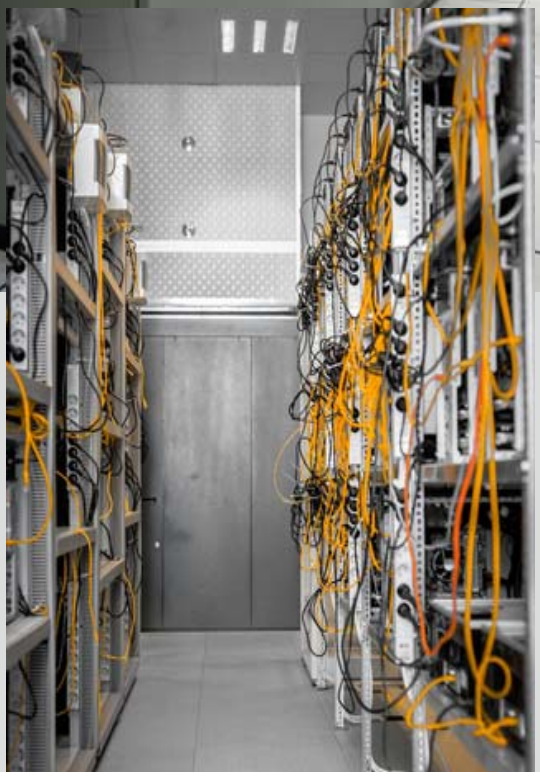
DATA CENTER SAVINGS

Each year, data centers consume two percent of all electricity used in the United States – enough to power all of the households in New York City twice over – causing the emission of tens of millions of metric tons of carbon dioxide. Energy Star has identified a list of best practices for improving data center efficiency, many of them centering on HVAC.



Server racks should be situated in rows in what is known as a hot aisle/cold aisle configuration. Rack fronts, where cold air is drawn in, should always face each other one aisle (known as a cold aisle) while hot air exhausts face each other on the next “hot” aisle. Cold aisles should face air conditioner output ducts and hot aisles should face return ducts. This allows HVAC systems to work more efficiently. Variable frequency drives, or VFDs, can reduce energy consumption by matching the cooling supply to the necessary load. Energy efficiency can be further improved by using VFDs in tandem with containment systems like blanking walls or flexible strip curtains.



Many data center managers miss out on substantial energy savings by operating at lower temperatures than necessary. By raising baseline temperatures, a data center can save as much as 4 percent in energy costs per degree. In 2008, Microsoft’s Silicon Valley data center saved more than $250,000 in energy costs by raising temperatures between two and four degrees. Air-side economizers are effective in reducing utility bills by taking advantage of cooler night and seasonal air to cool the environment, and water-side economizers can be used in facilities with chilled water plants. Data centers might also consider geothermal to provide a cooling assist.

DID YOU KNOW...

❍ Accurate diagnostics and permanent resolution of HVACR problems is important to every business. MSC’s vast diagnostic experience, continual technical training program, state-of-the-art tools and equipment, and comprehensive reporting enable us to supply the effective results our clients demand. View examples of our case studies below:
Educational Facility -- Medical Facility I
Pharmaceutical Plant -- Medical Facility II