A GUIDE TO AIR CONDITIONING COIL CLEANING:

WHY, HOW AND HOW OFTEN?

ARISTA

Introduction

Wouldn't it be great if you could install an air conditioner and it would just work reliably and efficiently for the next 15 to 20 years without any attention? If your business has an air conditioner and you're in charge of keeping it working, you probably already know that's not likely to happen. Air conditioners need regular maintenance to prevent breakdowns, maximize performance, decrease energy consumption, and prolong the lifespan of the equipment.

Coil cleaning is one of the most critical aspects of air conditioner maintenance, yet it's often misunderstood. As an air conditioning consumer who may never have taken a close look at the unit itself, you may wonder why it needs to be cleaned. After all, it's stuck up on the roof or in some hidden crawl space. Who cares if it's dirty? The short answer is, it's like the oil in your car's engine. It's out of sight, but if it's also out of mind and you neglect to take care of it, you're going to pay the price.

Even when you understand the need to clean the coils on your air conditioner, you may wonder how to do it right, and how to know when it needs to be done. In this guide, we'll address all your questions about why and how often to have your air conditioner's coils cleaned. And we'll provide tips on how to choose a provider that will do the job right.

NYC Air is rough on your HVAC equipment

There's a hazard that's just about impossible to avoid when you live or work in New York City. Call it by whatever name you like: soot, grime, air pollution, smog, airborne particulates. It all comes down to the same thing. The concentration of motor vehicles, diesel generators, construction, kitchen exhaust and industrial byproducts in and around the city leaves a layer of grimy black dirt on everything it touches.

You've probably seen the dramatic change that takes place when one of the city's old stone buildings is cleaned and restored; St. Patrick's cathedral is one example. In some cases, buildings that were thought to be black turned out to be a completely different color once the grime was removed.

What does all this have to do with your air conditioner's coils? Plenty. Those coils get fouled with the same pollution as everything else that's exposed to outdoor air.

If you have an HVAC system that relies on outside air to generate comfortable temperatures and decent indoor air quality, you can see the problem. And we mean you can literally *see* the problem—if your condensing unit is accessible, take a look at the coil fins and see for yourself. If they haven't been cleaned in a while, it's probably a nasty sight. Especially when you realize that this unit affects the air you're breathing all day long.

What's so special about coils, and why are they vulnerable?

The **condenser coil** is one of four (4) critical components of your air conditioning system. Its function is to help expel heat from the refrigerant gas in the system (turning it into liquid refrigerant) which then allows the liquid to flow to the evaporator coil where the cooling takes place. The condenser coil consists of very thin pieces of aluminum (fins) attached to copper coils that contain the refrigerant. In an air cooled system, there's a fan blowing outside air across those coils to cool them and help release heat from the refrigerant.

Where there's outside air, there's dirt. And those tight coils can quickly accumulate lots of it, impeding system performance and eventually causing it to fail completely. And that "eventually" can happen much sooner than you think in NYC.

The **evaporator coil** is in charge of removing the heat from the air in your space and also consists of finned coils and a blower fan. Since the evaporator coil is part of the indoor system, you might think it's safe from dirt and contaminants. But small dirt particles can make their way through your system's air filter and clog the evaporator coils as well. Once that happens, your cooling system is impeded and your unit will have a harder time cooling your space.

What happens when you don't clean your air conditioner coils

Inefficiency and higher energy bills

Soot coating the coils prevents heat transfer. When the spaces between the coils fill with dirt, little to no air can blow over the coils. Buildup on the coils means your equipment has to run longer and work harder to cool your building, and that uses more energy. The result: higher utility bills for you.

Did you know that only 1/100th of an inch of dirt buildup on your air conditioner's condenser coil reduces its efficiency by 5 percent? If your air conditioner has not been serviced in a while, the buildup of dirt and debris on the coils could be increasing your electric bill by as much as 20 to 30 percent.

How your air-cooled system works

For an air conditioning system to operate economically, the refrigerant must be used repeatedly. For this reason, all air conditioners use the same cycle of compression, condensation, expansion, and evaporation in a closed circuit. The same refrigerant is used to move the heat from one area, to cool this area, and to expel this heat in another area.

- The refrigerant comes into the compressor as a low-pressure gas, it is compressed and then moves out of the compressor as a high-pressure gas.
- The gas then flows to the condenser. Here the gas condenses to a liquid, and gives off its heat to the outside air.
- The liquid then moves to the expansion valve under high pressure. This valve restricts the flow of the fluid, and lowers its pressure as it leaves the expansion valve.
- The low-pressure liquid then moves to the evaporator, where heat from the inside air is absorbed and changes it from a liquid to a gas.
- As a hot low-pressure gas, the refrigerant moves to the compressor where the entire cycle is repeated.

Breakdowns and shorter equipment life

When a layer of dirt and debris collects on the coil, it acts as an insulator that interferes with the transfer of heat. When the coils can't do their jobs effectively, your unit's compressor runs hotter, longer and with higher pressure in order to provide the same level of cooling. First you'll notice that your space is not getting cool enough. If the pressure and get temperature get too high, the compressor may fail. Since the compressor is the heart of the system, it's possible you'll need to replace your air conditioner if that happens.

In some cases, high levels of contaminants in the soot can even cause corrosion of the condenser coil, leading to holes and refrigerant leaks. Leaking refrigerant not only causes your system to lose effectiveness, but it's a dangerous substance that causes environmental damage.

Poor indoor air quality

When the evaporator coil gets coated with dirt, the buildup can include mold and other contaminants that cause poor indoor air quality. These contaminants get circulated throughout your space via your ventilation system and can lead to respiratory issues for building occupants.

Factors that determine frequency for coil cleaning

Your HVAC service expert can determine how often the maintenance needs to be done based on the size of your space, the age and capacity of your system, the number of hours each day that the system is running, and where the equipment is located.

Here are some factors that may cause your coils to get dirtier, and need to be cleaned more frequently:

- **Your equipment**. The age and design of your air conditioner may make it prone to accumulating more debris.
- **Your usage**. How many hours per day does the unit run? How much space is it cooling? Is it appropriately sized? The answers to these questions can affect how often your coils need attention.
- **Close to street level**. Did you know there's more debris in the air closer to the ground? It gets even worse where there's a high volume of traffic from vehicles (which includes most of the city). That means your outdoor unit will need more frequent cleaning if it's located on the second floor than if it's on the roof of a high rise.
- **Nearby construction**. You can see it and you can smell it. Construction debris can be hard to avoid and hard to remove from your outdoor unit's coil. If there's demolition or construction going on, have your coils cleaned more often.
- **Nearby pollutants**. Everyone knows that space is at a premium in New York City. Because no one wants to use prime space for an air conditioning unit, they are often installed in less-than-ideal locations where they are close to exhaust from nearby businesses, kitchens, and industrial factories. It doesn't take long for these pollutants to build up on the coils.

Trust this job to the professionals

Don't think you can just send the janitor to dust off the condenser coils. The job requires the safe and proper handling of materials, not to mention the electric shock and fire hazards associated with exposed components if not handled properly. It also requires the tools and the training to do the job right without risking damage to the equipment. You may even find nested rodents or insects making their home in your condenser coil. It's best to leave this job to the trained professionals.

What to expect for a job done right

You want to be sure that the company you choose has the expertise to choose the correct tools and techniques for your equipment and your situation. Here are some questions you can ask to determine who's really qualified:

Will you protect the area around my equipment?

A responsible HVAC maintenance tech will start by protecting the area around the unit from damage with plastic tarps.

What cleaning method will you use?

There are several methods that can be used to remove the accumulated debris, including brushes and tools, spray-on chemical washes, compressed air and high-pressure water. It's important to choose the right method for the equipment and location. For example, it's not usually advisable to use compressed air on indoor coils, since the debris is blown back into the air around the unit and into the ducts. Many service providers will use high-pressure water combined with specialized brushes and chemical cleaners. But in some situations where it's impossible to bring hoses and water, other methods may be required.

What tools, equipment, and chemicals do you use?

You want to know that the company will not damage your equipment in the process of cleaning it. The use of chemical washes is often required to cut through grease and dissolve mineral scales, but they must use only

non-corrosive cleaners to avoid damage to aluminum or copper coils. When power-washing with water, it's important to use the right amount of pressure and spray at the correct angle to get at the grime without damaging the sensitive fins. There are also special brushes designed to extract deeply embedded dirt from inside the fins.

What other preventive maintenance tasks will you do?

It makes sense to have the coils cleaned as part of a regular air conditioner maintenance program. Why? Because while the system is disassembled and the coils freshly cleaned, it's easier to inspect for refrigerant leaks and check the other components for any impending problems that could lead to a breakdown. Here's what should be included in addition to cleaning the coils:

- Cleaning or replacing air filters
- Checking electrical connectors
- Checking refrigerant charge and checking for leaks
- Checking blowers
- Cleaning condensate drains
- Lubricating moving parts
- Checking thermostats

Preventive maintenance pays for itself

Some are tempted to forego regular HVAC service because they perceive it as too expensive. The fact is that the cost of routine preventive maintenance, including coil cleaning, easily pays for itself with the resulting reduction in energy costs. Regular service also saves you money by preventing more costly breakdowns, and by prolonging the life of your HVAC equipment.

Hire an experienced HVAC professional to regularly clean your condenser coils, as part of a preventative maintenance program that will not only lower your energy bills, but increase the lifespan of your equipment.

ABOUT ARISTA

Whether you're responsible for the installation of a new HVAC system or inherited legacy equipment, Arista has the experience to service and maintain any system throughout its lifecycle. Across the tri-state area, we're recognized as one of the region's most respected and referred HVAC experts. When you purchase a preventive maintenance service agreement from Arista, you're backed by an industry leader with that has earned its reputation through decades of trustworthy business conduct and quality service.

Peace of mind at a fair price

Your account is managed by a senior Arista technician and backed by an expert staff of over 160 highly trained professionals. Arista boasts a comprehensive program of continuous staff training and professional development on state-of-the-art practices and processes.

Arista clients also enjoy these benefits:

- Quick-to-respond, accessible workforce and a fleet of 100+ vehicles
- 24/7 emergency standby service
- 30,000 sq. ft. corporate warehouse facility stocked with over 55,000 parts
- Industry recognition as the only NY state company to earn both the prestigious MSCA STAR and GreenStar designations
- LEED Accredited Professionals to assist in making smarter HVAC choices

Questions? Call Arista today.

We hope you've found this guide to be a handy reference as you evaluate the types of service contracts available to you.

We invite you to call us for a quote on your equipment purchase or service needs. We think you'll agree that hearing what we have to say will be one of the best decisions you make in researching HVAC maintenance contracts. Reach an Arista HVAC specialist today at 718-937-4001 or email info@aristair.com.

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