



M O D E R NTM
PURAIR
INDOOR AIR QUALITY EXPERTS

Coil Cleaning Program

Procedures and Calculations that Affect your Bottom Line

- Fact:** Did you know that annually cleaning HVAC coils reduces energy consumption in most cases enough to pay for the cleaning cost in six months?
- Fact:** That means for every dollar spent cleaning coils correctly, there is an equal dollar in energy savings for each unit.
- Fact:** Did you know that neglecting condenser and evaporator coils can increase energy consumption of each unit more than 15%?
- Fact:** Coil cleaning also saves money by prolonging the operating life of each unit by reducing the run time.
- Fact:** Are you aware that four out of five service contractors clean coils incorrectly?
- Fact:** Besides energy dollar savings every year, Modern PURAIRTM customers also benefit from equipment evaluations at each location.





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Left to Right – Bob Elliott, Lane Martin and Don Martin

**Only Modern PURAIR™ Offers
the most cost-effective HVAC
equipment evaluation, coil cleaning,
filter maintenance, and IAQ solution
with our industry leading 30 day
satisfaction guarantee.**

We at Modern PURAIR would like to thank you for taking an interest in our company. In recent years, we have grown from servicing and cleaning air ducts into being a premier Indoor Air Quality service provider with franchises located across Western Canada. Part of our success stems from our trademarked cleaning systems, our industry leading accountability service methods, our incredible team and culture, and our over 50 years of HVAC experience.

We are a Canadian company that puts people first. Helping to provide clean indoor air through effective, environmentally conscious methods is what we do. Happy, smiling people that care about a healthy lifestyle for everyone is who we are. We are an innovative company that provides solutions and invents methods, securing Modern PURAIR as the industry leader in HVAC cleaning and filtration maintenance.

Within these pages, you will find some sample ways to calculate your organizations energy consumption (along with national kWh costs to aid your savings calculations), our coil cleaning procedures, and a method for estimating the non-energy costs associated with HVAC coils in your building.

Please visit our website, www.modernpurair.com, and do not hesitate to contact us with questions at breatheasier@modernpurair.com.

Thank you for your interest.



Lane Martin, Co-Founder





What can you expect if HVAC coils aren't kept clean?

- Higher than necessary electric bills
- Excessive and unnecessary repair bills
- Premature component failure
- Lack of humidity removal
- Compressor failures
- Loss of cooling capacity

Most modern air conditioners are designed to operate within much smaller tolerances than they did 20 years ago. With emphasis being placed on higher operating efficiencies (known as S.E.E.R. or E.E.R.), air conditioners are being asked to deliver the maximum amount of work for the least amount of electrical consumption. Therefore, any field conditions that cause deviations from optimum operation can have a detrimental effect on the performance and life of a unit.

If you expect your air conditioner to perform reliably for years to come, a small investment in preventative maintenance pays for itself through lower electric bills, repair costs and replacement expenditures.

When components like coils are exceptionally dirty, motors and compressors have to work harder to deliver cool air to the facility. This directly affects your electric bill at each location. The added work load results in higher current draw to operate the motor and the compressor. Additionally, when a motor or compressor has to work harder, it is also more likely to fail.

Any restrictions caused by dirty coils place stress on all of the components in the refrigeration cycle. The compressor removes heat and humidity from the air by pumping refrigerant through the evaporator and condenser coils. The air is also cleaned as it passes through the filter media within the unit. If the coils are dirty, airflow is restricted and the coils cannot effectively dissipate heat and remove humidity. This causes "stress" on the system, especially the compressors.

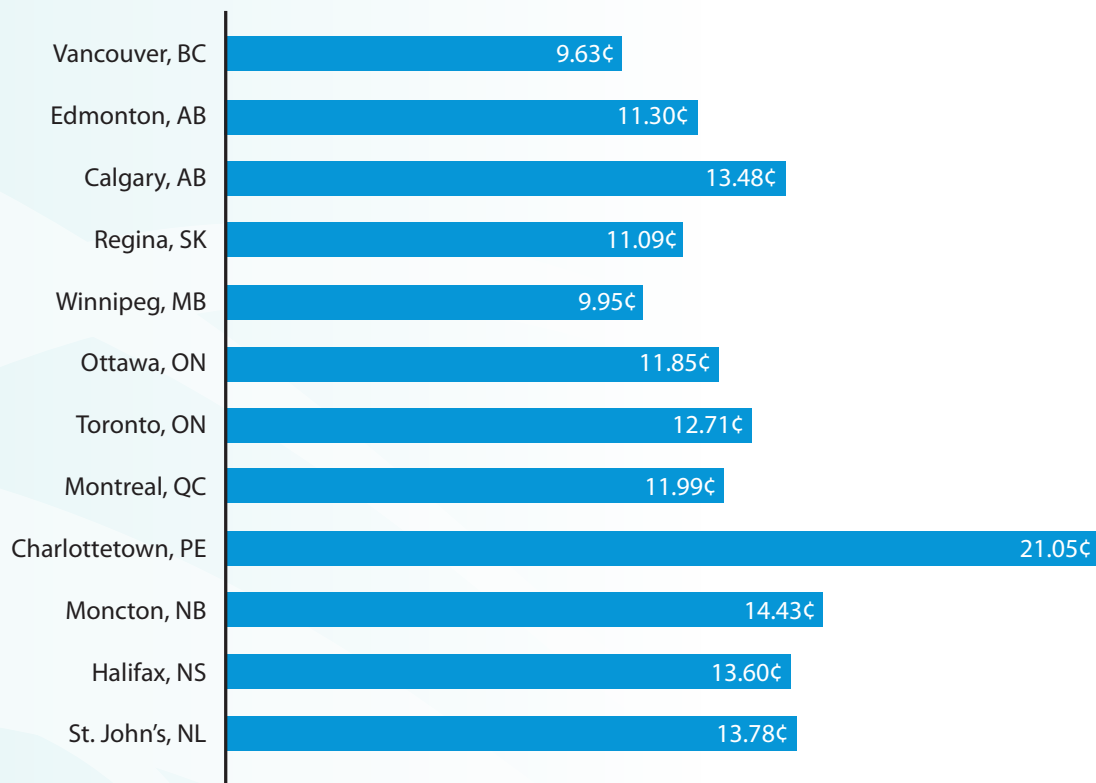
Increased Energy Cost at 10¢, 15¢ and 20¢ per kWh*

	Volts	Amps	Watts	kW	Annual Cost	Increase in Energy Consumption with Dirty Coils	10¢ per kWh	15¢ per kWh	20¢ per kWh
5 Ton Unit	480	20	16608	16.6	\$1,792.00	0% with clean coils	—	—	—
	480	21	17483	17.4	\$1,879.00	5%	\$87.00	\$130.50	\$174.00
	480	22	18268	18.2	\$1,965.00	10%	\$173.00	\$259.50	\$346.00
	480	23	19099	19.1	\$2,062.00	15%	\$270.00	\$405.00	\$540.00
10 Ton Unit	480	40	33216	32.2	\$3,584.00	0% with clean coils	—	—	—
	480	42	34966	34.8	\$3,758.00	5%	\$174.00	\$261.00	\$348.00
	480	44	36536	36.4	\$3,930.00	10%	\$346.00	\$519.00	\$692.00
	480	46	38198	38.2	\$4,124.00	15%	\$540.00	\$810.00	\$1,080.00
10 Ton Unit	480	80	66432	66.4	\$7,168.00	0% with clean coils	—	—	—
	480	84	69753	69.6	\$7,516.00	5%	\$348.00	\$522.00	\$696.00
	480	88	73072	72.8	\$7,860.00	10%	\$692.00	\$1,038.00	\$1,384.00
	480	92	76396	76.4	\$8,248.00	15%	\$1,080.00	\$1,620.00	\$2,160.00

**Based on 3Phase equipment, operating six hours per day for 180 days of cooling.*



Regional energy costs per kWh



**All figures from 2009 – Comparison of Electricity Prices in Major Cities by Quebec Hydro Report*

When compared to competing companies that provide basic coil cleaning service, Modern PURAIRTM is still 20 to 40% below competitors' pricing. Modern PURAIRTM is Canada's largest IAQ franchise network, and our trademarked PURCURx cleaning systems make us the cost effective choice when it comes to coil cleaning, duct cleaning, HVAC cleaning and IAQ testing.

For more information about our complete line of services, please visit our website at **www.modernpurair.com**



HVAC Coil Cleaning Procedures Cleaning and Evaluation Specifications.

1. Pictures are taken of the RTU unit number, and the Coils.
2. The disconnect is turned off and trash and debris are re-moved from the unit and surrounding area. Condensers are then PURAIR™ washed, starting in the opposite direction of the air flow to prevent pushing obstructions deeper into the coil. The coils must be washed from both directions (continuing until exiting water is clear).
3. A 90 degree tip will be used in order to protect the coils (all coils need to be cleaned at a perpendicular angle or directly facing the coil).
4. Condenser coils that have extreme lint and dust accumulation, are cleaned first with our PURCURx™ contact cleaning system.
5. Cleaning solutions used are all bio-degradeable, approved for use in Occupied Space, non-corrosive, and leave as minimal residue as possible.
6. Compressed air must be used where water might be hazardous. Using compressed air would apply to any unit where control power or any other power outside the unit disconnect is a concern.
7. When cleaning the evaporator coil, we place a plastic panel inside the unit and utilize a vacuum if necessary to ensure that water does not enter the return duct or the building.
8. All screws in panels or doors are installed and lost screws are replaced. The technician uses #10x3/4, 5/16 self tapping screws. If the screws are stripped out, #12 oversized screws are used to secure panel or door.
9. The base pan (floor) area is washed as many compartments as possible. Dirt and debris are also washed off the RTU exterior and away from the unit. All debris and trash from the area around the rooftop units are re-moved.
10. An evaluation of each unit is done at the time the coil cleaning service is performed.
11. After the evaluation is performed, each location will have an assessment report of each unit. The report will include a photograph of each unit. Additional photos will be taken of the issues listed below and of any other problems found:
 - Excessive dirt or clogged condenser coils
 - Excessive dirt or clogged evaporator coils
 - Loose belt
 - Freon leak
 - Drain line or P-trap problem
 - Drain pan (clogged, leaking, or not sloping – no fall or pitch
 - Visual wire or contactor problem
 - Frozen coil
 - Filter problem (improper size, fit, or bypass)
 - Condenser coil hail damage
 - Dead unit
12. If the unit is not operational, the appropriate contact for that location will be notified. Anything not critical may remain in the assessment report.



The graph below presents some of the failures and effects stemming from dirty coils, where arrows represent causal relationships.

By calculating the probabilities and costs of each of the failures, a company's total risk exposure due to coil fouling can be determined.

Please visit www.modernpurair.com for more information.

