

**BLADE**

# Case Study

The Gooderham & Worts Distillery District  
**Energy Efficiency and Indoor Air Quality Trial**

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*Toronto, Ontario*  
December 2022

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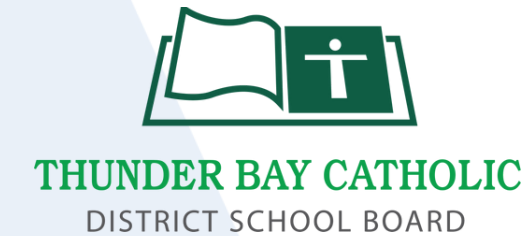
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# BLADE

We specialize in creating clean-air environments for businesses and organizations across all industries. A manufacturer of tailored, state-of-the-art indoor air quality technology that meet the highest industry standards.

# MANAGING OVER 50 MILLION SQ FT OF BUILDING SPACE



# SYNOPSIS

In December 2021, the Distillery District management team contacted Blade Air looking for a solution to improve the indoor air quality in their buildings from the current MERV-13 filters they were running. Searching for a solution, the Distillery District's main concern was around the prohibitive costs of installing and maintaining a HEPA or UV solution, which are incredibly energy intensive. Instead, they were looking for a solution that would be able to find a balance between their desire to continuously reduce their carbon footprint while also creating a healthier workspace for their tenants.

The solution was the implementation of Blade Air's electrostatic polarized filters (ESF). These filters utilize active polarization fields to outperform HEPA in their capture efficiency of particulate matter in the viral range. Each filter has close to a 90% lower static pressure than HEPA and over 70% lower than the MERV-13's that had been installed. In addition to outperforming the capture efficiencies of HEPA, like UV, these filters are also able to inactivate viruses. The significantly lower static pressure of the units and minimal amounts of electricity required to power the solution offer significant energy savings.

With the technology selected, Blade Air and the Distillery District agreed to a trial where the solution would be implemented across two buildings- the Stone Building and the private school on-site, Voice Integrative School.

The following two trials were facilitated:

- 1. Energy Savings Trial**
- 2. Indoor Air Quality Monitoring Trial**

The trials were agreed to be completed on the second floor of the Stone Building, in offices that were at full capacity. The trials took place throughout a 70-day window, starting ten days prior to installation and finishing 60 days after.

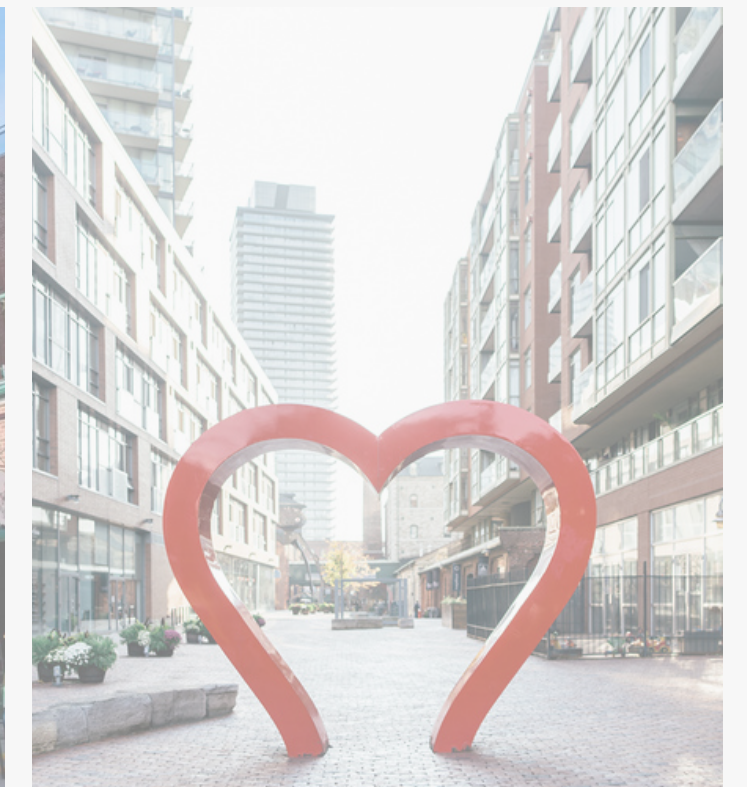
The results of these trials came back with astoundingly positive results. Blade generated energy savings of up to 75% in fan motor consumption and their filters performed 2.25 times better than the MERV-13 filters in capturing and removing bacteria from the airstream.



# ABOUT THE DISTILLERY DISTRICT

The Distillery Historic District opened in 2003, and today it is widely regarded as Ontario's premier arts, culture and entertainment destination and one of their hottest tourist attractions.

It is an internationally acclaimed village of brick-lined streets and 47 vibrantly restored 19th-century, Victorian Industrial buildings. A major dining, shopping, and cultural hub in Toronto, Canada.





# ELECTROSTATIC FILTERS

Manufactured in Canada 

Reduce energy consumption while improving indoor air quality from traditional pleated filters.

Using active polarization, these units capture 40x smaller particles than traditional filters and operate at a MERV-14 equivalency.

SUSTAINABLE

**70%**

Recycled Filter Pad

ENDURING

**2x**

Longer-Lasting

EFFECTIVE

**40x**

Smaller Particles Capture



# OVERVIEW: ENERGY EFFICIENCY TRIAL

The purpose of these trials was to demonstrate the capacity of the electrostatic filter to reduce energy consumption without compromising airflow.

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## **Phase One**     *July 27 - August 4, 2022*

Installing a meter on existing AHU and monitoring the systems' energy consumption with MERV-13 filters installed.

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## **Phase Two**     *August 4 - August 16, 2022*

Installing the electrostatic filters and a variable fan drive (VFD) in the systems.



# THE RESULTS

The combination of upgrading the filters and installing a Variable Frequency Drive allows for maintained system airflow, improved filtration efficiency and a 75% reduction in supply fan motor consumption.

36 Distillery - Filter Upgrade Paired with VFD Installation	
Preliminary Airflow measured with newly installed pleated filters	4,147 CFM
Airflow Measure with updated Blade Air Electrostatic Filters	5,384 CFM
<i>Log July 27 - August 4, 2022</i>	
Amperage (A) measurement without VFD installation	4.66 A
Kilowatt (Kw) consumption	4.2 Kw
<i>Log July 27 - August 4, 2022</i> (VFD speed configured to 48 Hz – airflow rate matches original measurements taken with pleated filters)	
Airflow measured with VFD and Blade Air Electrostatic Filters	4,267 CFM
Amperage (A) measurement with VFD @ 48 Hz	1.27 A
Kilowatt (Kw) consumption	1.07 Kw

# OVERVIEW: INDOOR AIR QUALITY TRIAL

The purpose of this trial was to demonstrate the efficacy of the electrostatic filter in improving indoor air quality in contrast to the post-SaRs-CoV-2 pandemic standard of MERV-13 filtration.

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## **Phase One**    *July 11, 2022*

Measuring IAQ with the systems that were currently installed (MERV-13)

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## **Phase Two**    *August 22, 2022*

Measuring IAQ approximately 30 days post-installation of electrostatic filters.

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## **Phase Three**    *September 26, 2022*

Measuring IAQ approximately two months post install of electrostatic filters to demonstrate the ongoing integrity.



# THE RESULTS

## Live Airborne Mould Spores

Blade Air electrostatic filters perform 2.25x better than the standard MERV-13 filter in dispersing live bacteria in the indoor environment.

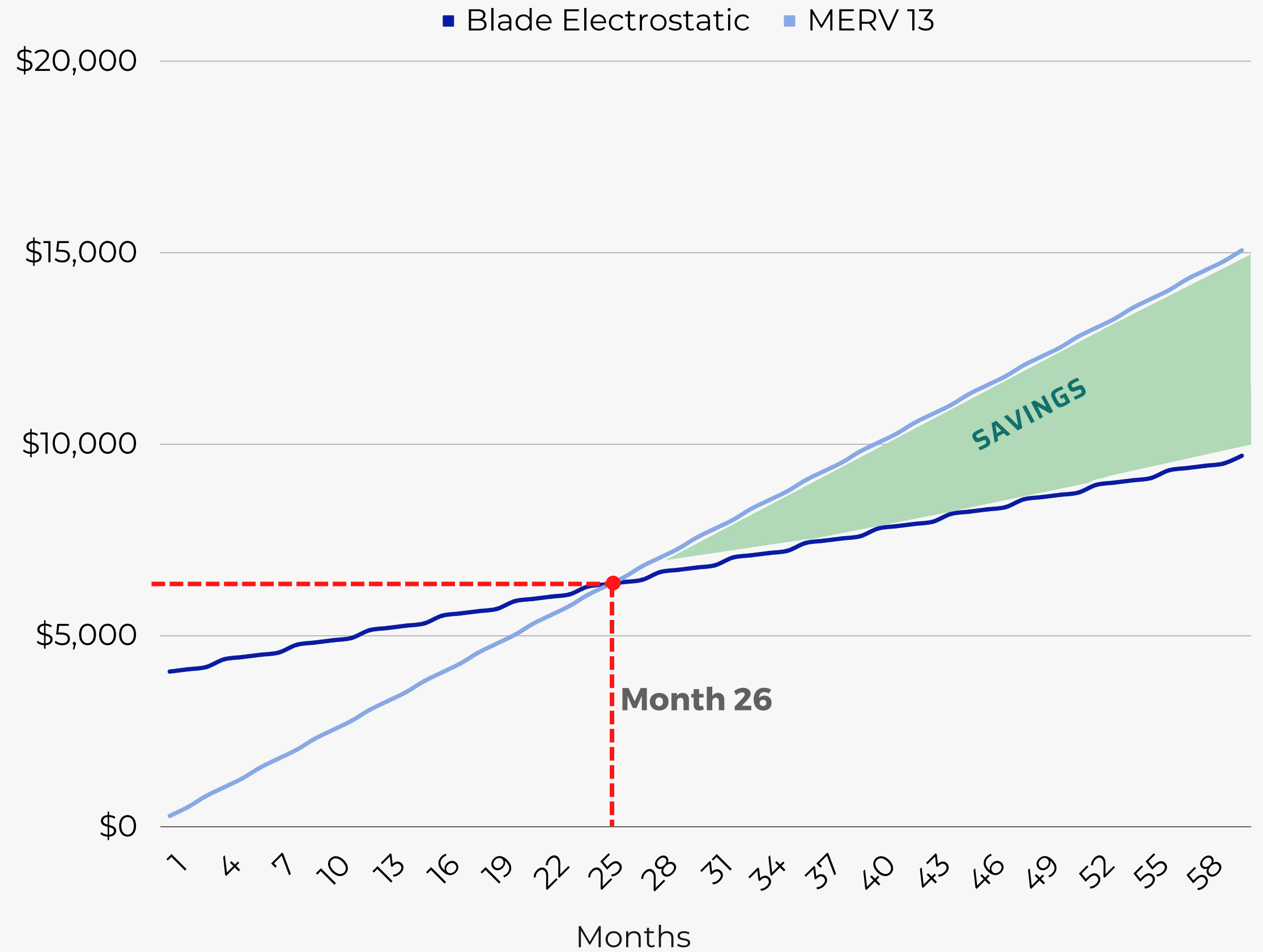
## Live Airborne Bacteria

Blade Air electrostatic filters will more than likely destroy contaminants of submicron sizes, such as viruses, during their passage.

## Live Airborne Viruses

Blade Air electrostatic filters perform equally to a MERV-13 filter in managing the dispersion of living mould spores in the indoor environment.

# BREAKEVEN ANALYSIS





# PROJECT BENEFITS



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## ENERGY SAVINGS

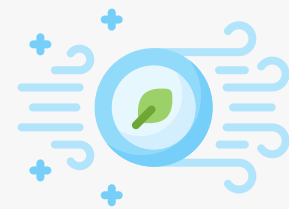
Save up to 75% in energy consumption through the reduction of fan motor energy consumption.



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## REDUCE MAINTENANCE COSTS

See up to 35% in energy cost savings and 50% in labour maintenance fees.



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## ENHANCED INDOOR AIR QUALITY

Improve filtration performance by 2.25x and reduce airborne pathogen transmission.



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## IMPROVED COGNITIVE FUNCTION

Enhancing IAQ positively correlates to improved cognitive function and productivity levels.



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