



zenGUARD™

Enhanced Air Filters

Viral infections are caused by transmission nearly entirely indoors in under-ventilated spaces.

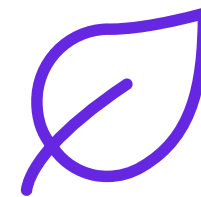
Indoor air quality (IAQ) improvement strategies come with a financial and environmental cost.

This is typically driven by capital investment or increased energy usage and carbon emissions from HVAC systems.

With buildings consuming ~40% of global energy, they are a major contributor to climate change¹.

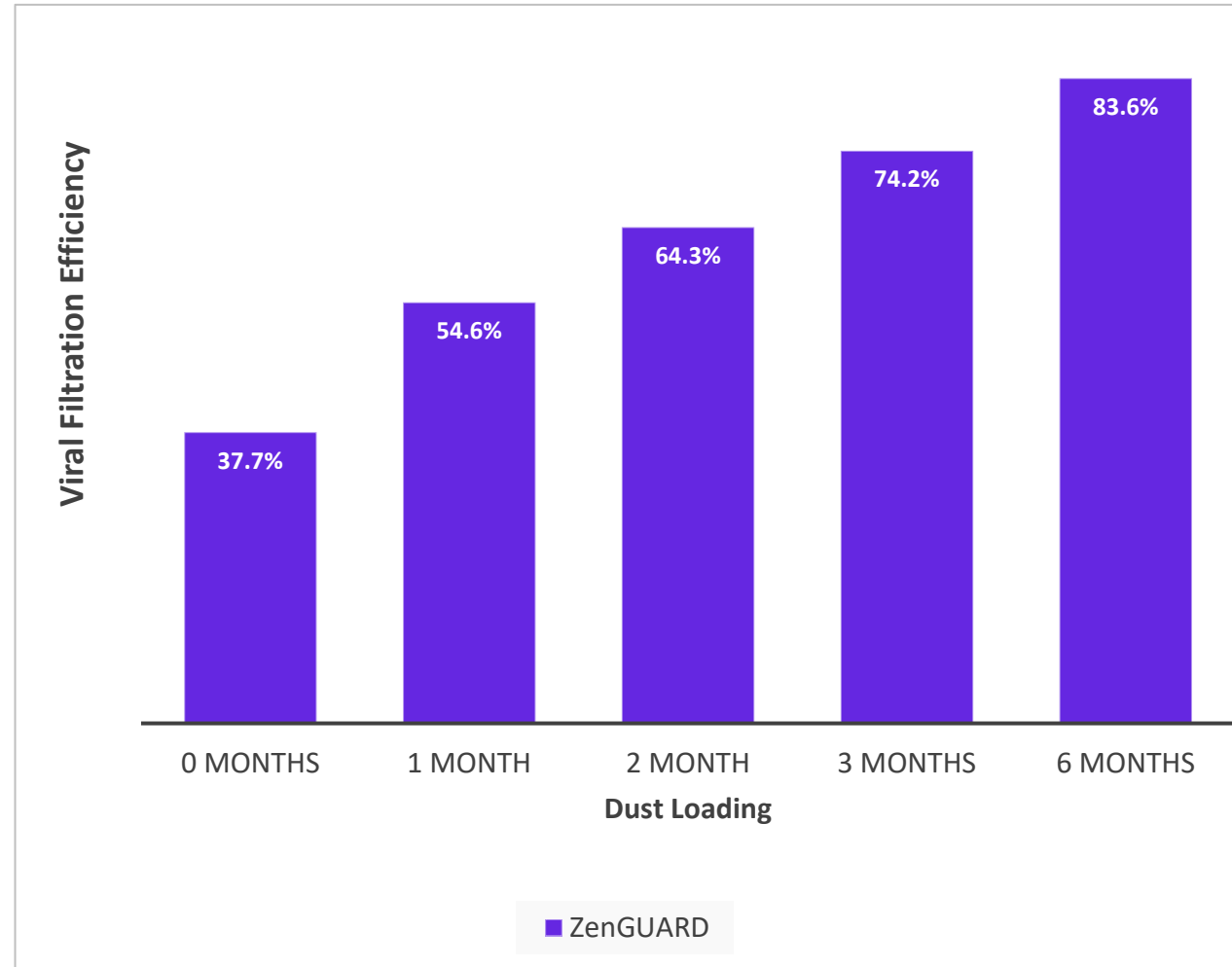
IAQ and healthy buildings are crucially important; so is building decarbonization.

**ZenGUARD™ Enhanced Air Filters can
give facility managers an innovative,
carbon-conscious option for healthier
buildings using existing HVAC systems.**



ZenGUARD™ Enhanced Air Filters (MERV 9) have an average viral filtration efficiency (VFE) similar to a MERV 13.*

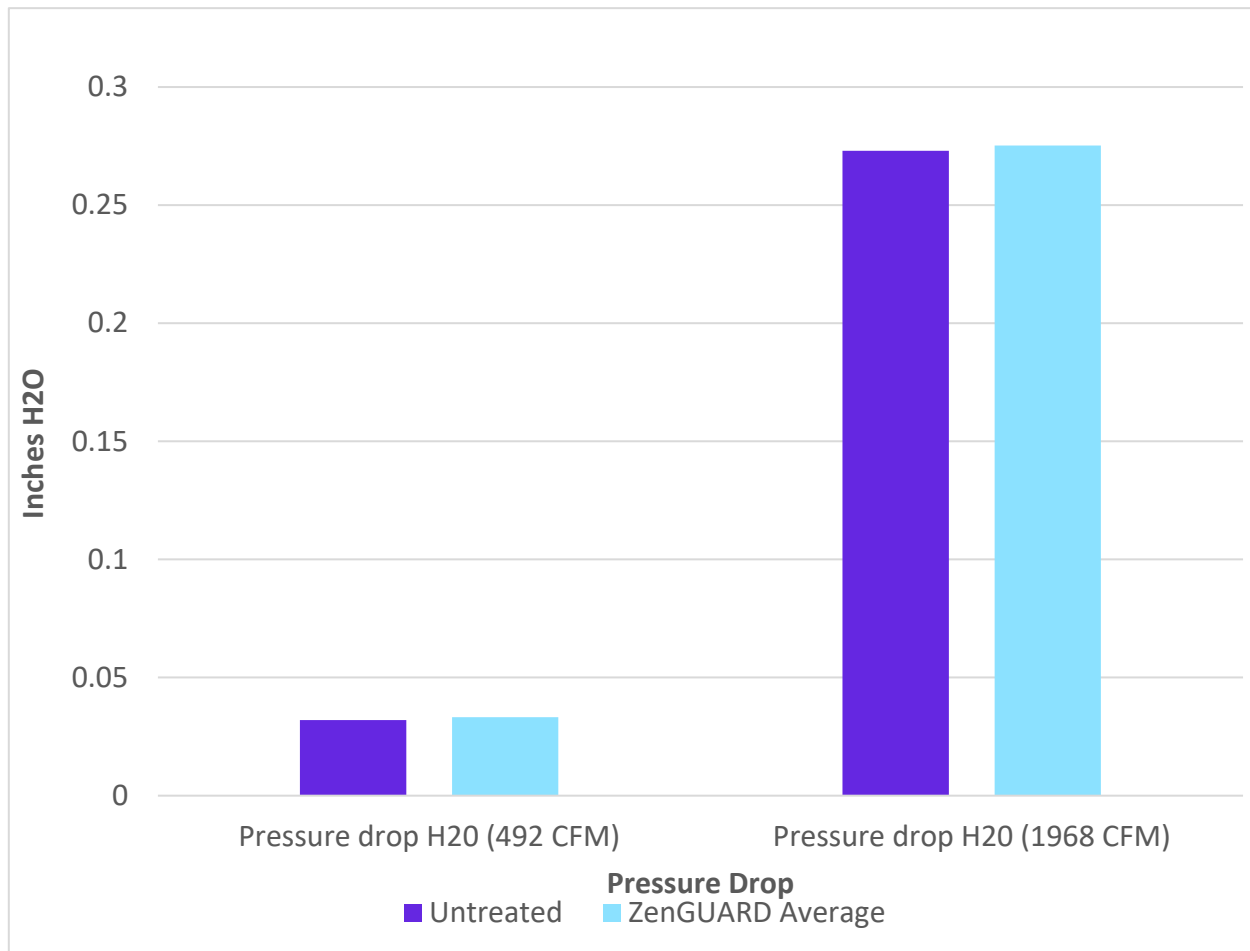
Viral Filtration Efficiency over Lifetime of HVAC Filter Under Typical Dust Loading Conditions



* Based on 6-month average filtration efficiency of ~67% for ZenGUARD™ Enhanced Air Filters of ~0.1-micron sized aerosol, compared to ASHRAE 241 guidelines for MERV 13 E1 particle size efficiency (>50% for particle size range 0.3-1 micron). Third-party testing and report completed LMS Technologies.

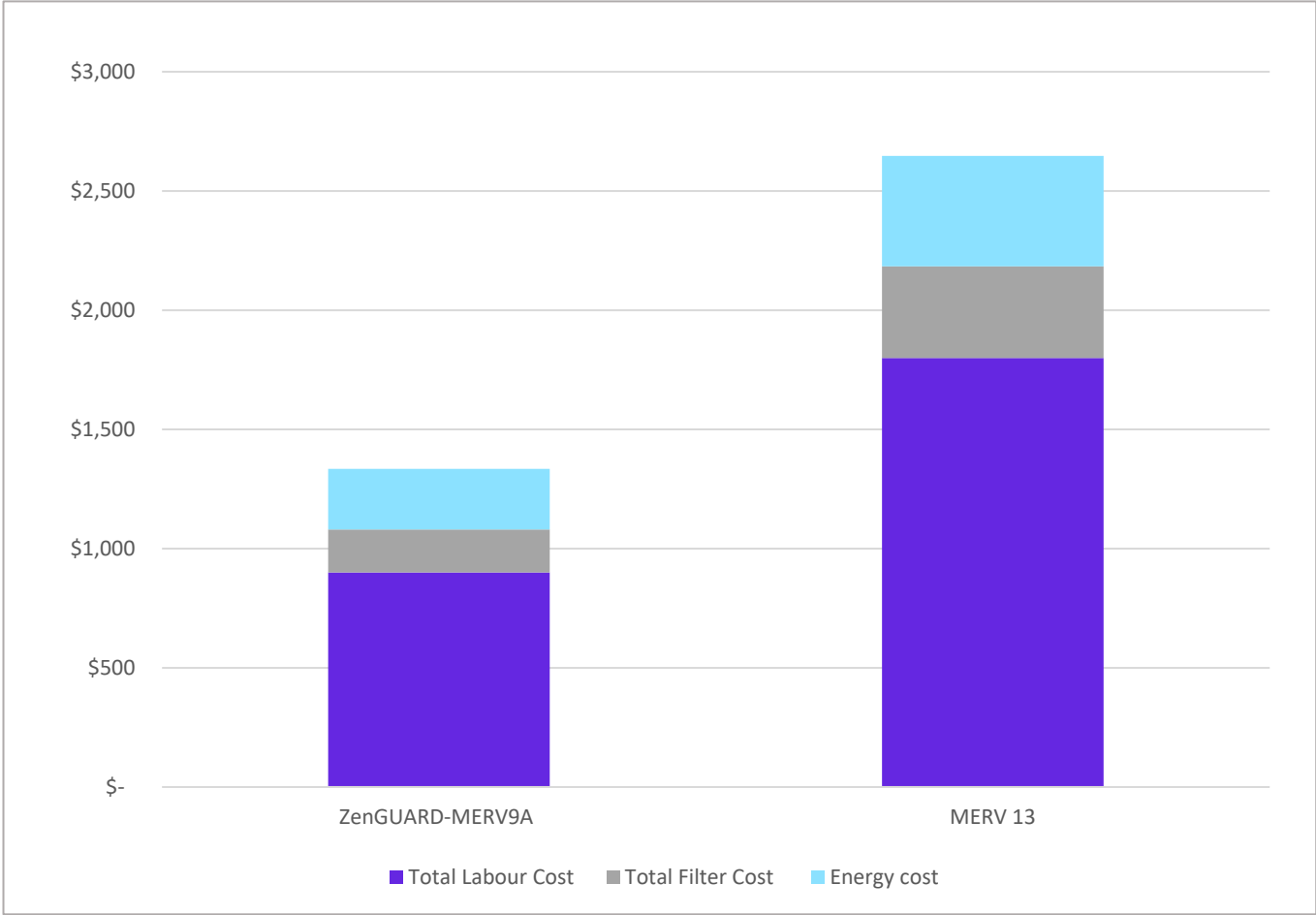
ZenGUARD™ Enhanced Air Filters have no increase in pressure drop compared to a regular MERV 9, all while filtering viruses similar to a MERV 13 over its 6-month life cycle.

Pressure Drop: ZenGUARD™ MERV 9 vs Regular MERV 9



ZenGUARD™ Enhanced Air Filters have the potential for a ~50% decrease in total cost of ownership compared to a MERV 13 filter.*

Estimated Annual Total Cost of Ownership (10,000 square foot space)



*Values and calculation use various third-party sources. Inquire for more information.

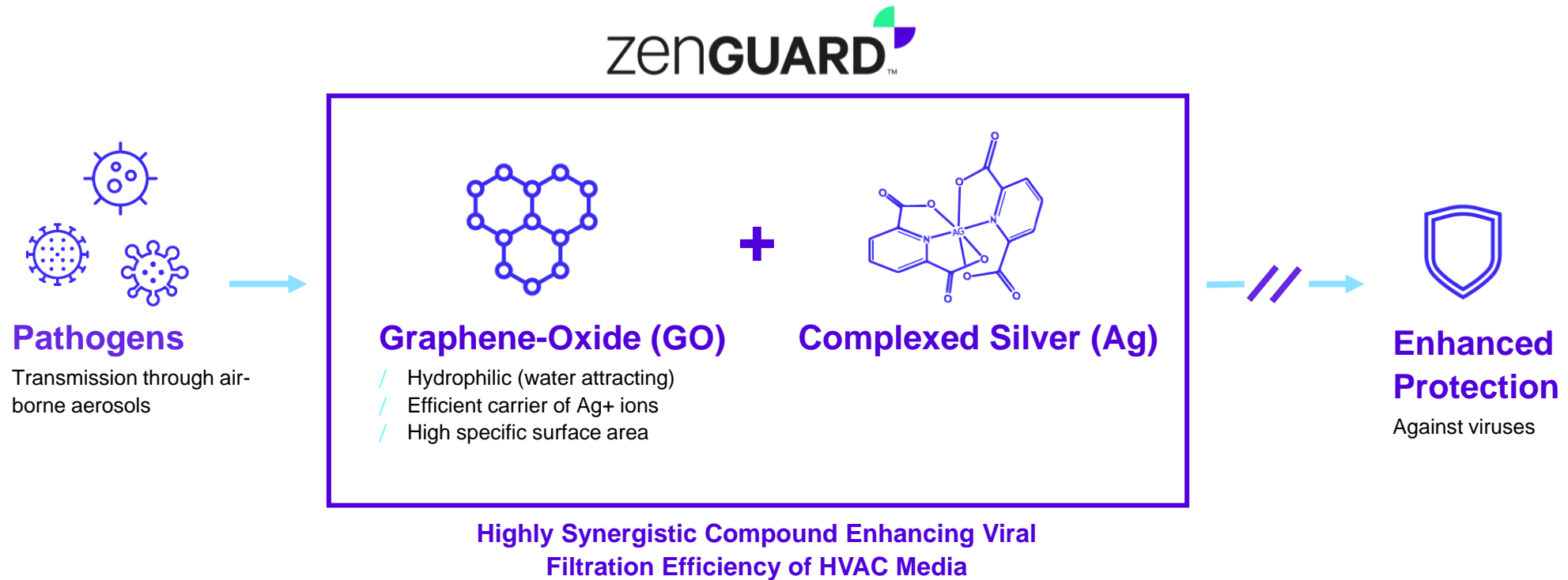
Better viral filtration efficiency means healthier buildings and healthier people.

Lower pressure drop means less energy consumption and fewer emissions.

Fewer change outs means less waste and lower cost of ownership.



zenGUARD™: How it Works



zenGUARD™: Independent Validation

Our solution is backed with strong scientific research and industry leading third-party validation, proving scalable benefits and performance.



Government of Canada Testing Stream Contract

Innovative Solutions Canada (ISC) Open Call For Innovative Prototypes to address a variety of priorities within the GoC. The GoC had great interest in indoor air quality solutions that achieve a net reduction in airborne viral load without requiring modifications to existing HVAC systems, reducing air flow rates, or compromising air quality.



NRC and CREMCo Labs Validation

Underwent rigorous testing in a modular room, simulating a real-world classroom environment. The NRC's (National Research Council of Canada) validation confirms ZenGUARD's effectiveness in filtering airborne viruses, contributing to safer indoor spaces.



ParticleOne Risk Assessment Study

ParticleOne, renowned for its virus-resiliency software, evaluated ZenGUARD's filtration performance. The results showcased its powerful viral filtration action, effectively reducing the spread of infectious particles and enhancing indoor safety. It also proved significant correlation and potential cost savings from absenteeism related to poor IAQ.



LMS Technologies Microbiology Report

LMS Technologies Inc., a leader in innovative HVAC and bioaerosol testing, detailed the performance of filters treated with ZenGUARD when challenged with bioaerosol contaminant. The testing highlighted how ZenGUARD Enhanced Air filters were positively affected by the dust loading process that happens over the life span of the filter.

zenGUARD™ Value Proposition

Building Operator Case Study:

- 10,000 sq ft office with 75 employees using MERV 9 filters.
- What can ZenGUARD™ Enhanced Air Filters do for me, my employees, their families and society?

Each Year We Can:



Reduce absenteeism costs by ~\$15,000²



Save the healthcare system ~\$13,750³



Reduce energy costs by ~\$12,400^{4*}

*Based on achieving an equivalent reduction in infection risk from bringing more outside air into the building as using a ZenGUARD-enhanced filter compared to an equivalent non-enhanced MERV-rated filter. Assumes energy required to achieve 10°C gradient to condition outdoor air at a price of C\$ 0.15/KWh.

zenGUARD™ Decarbonization Opportunity

Building Operator Case Study:

- 10,000 square foot office with 75 employees using MERV 9 filters.
- My HVAC system can't use higher rated filters to reduce the risk of transmission indoors, so I increase the percentage of outside air, which is one of the CDC recommended strategies.
- What if I use a ZenGUARD™ Enhanced Air Filter to keep my space safe rather than significantly increasing outside air, which I need to heat or cool to room temperature?

Each Year We Can:



Save the equivalent of 32 tonnes of CO₂ eq per year^{4,5}



That's the same amount as driving an internal combustion engine car approximately, 188,000 km^{4,6}

Why zenGUARD™ ?

Healthier Buildings, Fewer Emissions, Less Waste, Lower Cost

Enhanced Protection	<ul style="list-style-type: none">/ Efficiently filters extremely small virus particles in aerosol similar to MERV 13 (tested at 0.1-micron particle size).*
Cost Savings & Less Waste	<ul style="list-style-type: none">/ Recommended change out every ~6 months rather than every ~3 months typical of more dense filters like MERV 13./ Fewer filters means less waste and fewer emissions from production, reducing our environmental footprint.
Optimized Performance & Fewer Emissions	<ul style="list-style-type: none">/ Better airflow compared to other more dense filters for improved energy efficiency, reduced carbon emissions and potentially less strain on HVAC systems./ Potential alternative to more dense filters, costly HVAC upgrades and energy-consuming equipment like air purifiers for controlling infectious aerosols.
Plug & Play	<ul style="list-style-type: none">/ Installed just like a typical HVAC filter.
Multiple Uses	<ul style="list-style-type: none">/ Can be applied to most HVAC media to potentially target different MERV-rated filters and markets in the future.

* Based on 6-month average filtration efficiency of ~67% with dust loading for ZenGUARD Enhanced Air Filters of ~0.1-micron sized aerosol, compared to ASHRAE 241 guidelines for MERV 13 E1 particle size efficiency (>50% for particle size range 0.3-1 micron). Third-party testing and report completed by LMS Technologies.



zenGUARD™ Enhanced Air Filters

Healthier buildings, less energy, fewer emissions,
lower cost.... **using what you already have.**

Simple.

zenGUARD™ : Manufacturing Centre and Coating Line

- 26,000 square foot newly built industrial facility
- Home to ZenGUARD™ coating production, material coating, and slitting capacity
- Annual ZenGUARD™ production capacity of 20+ tonnes per year – making it one of the largest nanomaterial production facilities globally



ZenGUARD™ Manufacturing Centre and Coating Line Guelph, ON.

Upcoming Priorities

2024-2025

Commercialization and Procurement

Health Canada Collaboration	Commercialization Pathway	Stronger Partnerships	Global Expansion
<p>Paving the way for product launch and wider adoption is our submission to the Pest Management Regulatory Agency (PMRA).</p>	<p>Focus on unlocking broader market access by collaborating with the Canadian Government in our exclusive Pathway to Commercialization program.</p>	<p>Continued efforts to build robust relationships with manufacturers and distributors to potentially propel growth and market reach.</p>	<p>Leveraging our success in Canada and PMRA approval to explore other potentially advantageous markets.</p>



Healthier Buildings, Fewer Emissions, Lower Cost

Contact Us:

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