



# Megalam<sup>®</sup> EnerGuard<sup>™</sup>

The Next Generation HEPA Terminal Panel for Life Sciences

A person wearing a white cleanroom suit and blue gloves is shown from the chest up, reaching up to touch a white HEPA terminal panel. The panel has a grid of vertical lines. The background is a cleanroom environment with white walls and ceiling panels.

# Megalam<sup>®</sup> EnerGuard<sup>™</sup>

Built Tough to Protect Operations and Save Energy

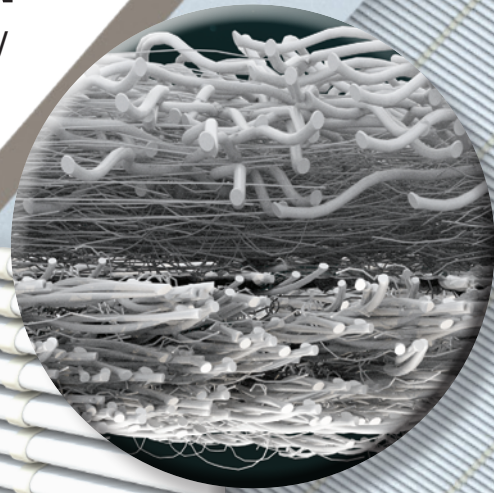
*The first revolutionary  
change for cleanroom  
HEPA filtration in decades.*

CLEAN AIR SOLUTIONS

## Megalam® EnerGuard™

Built Tough to Protect Operations and Save Energy

**Megalam EnerGuard** is the latest terminal HEPA/ULPA filter developed by Camfil specifically for the life sciences industry through years of research and application testing.



**THE MAGIC IS IN THE MEDIA**  
The best features of all HEPA filter media types.

**UNIQUE MEDIA DEVELOPED AFTER YEARS OF CONTINUOUS RESEARCH & DEVELOPMENT**  
Camfil's EnerGuard media is resistant to damage during handling and operation while still providing the efficiencies required to maintain ISO cleanroom class levels.

**FITS ALL EXISTING CONFIGURATIONS**  
Immediately substitutable into existing filter configurations, requiring no changes of other filter components or materials, installation or testing and validation processes, or HVAC and filter equipment.

### What Makes EnerGuard the Only Choice:



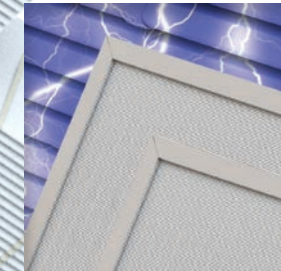
#### Robust Construction

**Filter failure rate at installation close to 0%.**  
The robust nature of the filter significantly reduces the chances of product failure and expensive cleanroom downtime. Filters safeguarded from damage during transportation, installation, handling, and filter service translate to cleanroom operating profits.



#### Long Service Life

**Service life is consistent with glass fiber filters; 2-3X the life of ePTFE when periodically aerosol challenged.**  
Depth-loading media increases the effective area of particle capture to maintain consistent low pressure drop and increases the period between filter replacements.



#### Energy Cost Savings

**Savings of 30 to 50% vs. traditional glass media filters.**  
Camfil's new EnerGuard filter is specifically designed and tested to ensure the lowest possible energy consumption.



#### Efficiencies and Offerings

**Complete range of efficiencies to suit all current operations.**  
Available in H13, H14, and U15 efficiencies. Offered in standard and customized pack depths.



#### Process Safety

**Certified for life sciences use.**  
When you see the ProSafe symbol you can be sure the filter materials, assembly, and testing meet life sciences requirements for safety, traceability, and control.  
See page 7 for more information about ProSafe.

# Megalam® EnerGuard™

## TOTAL COST OF OWNERSHIP

### ENERGUARD ROBUSTNESS

Handling Forgiveness  
for More Operation Efficiency

Protect your process, product, profits, and people from inadvertent filter damage. Megalam EnerGuard filters offer outstanding robustness to reduce the risk of airborne particulate leakage from tears, punctures, and rips in the filter media which is common from mishandling during installation and validation.

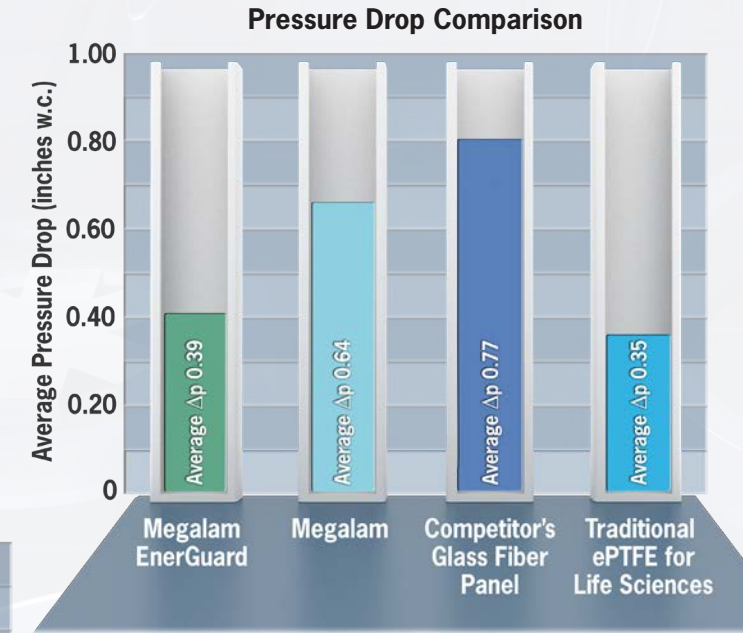
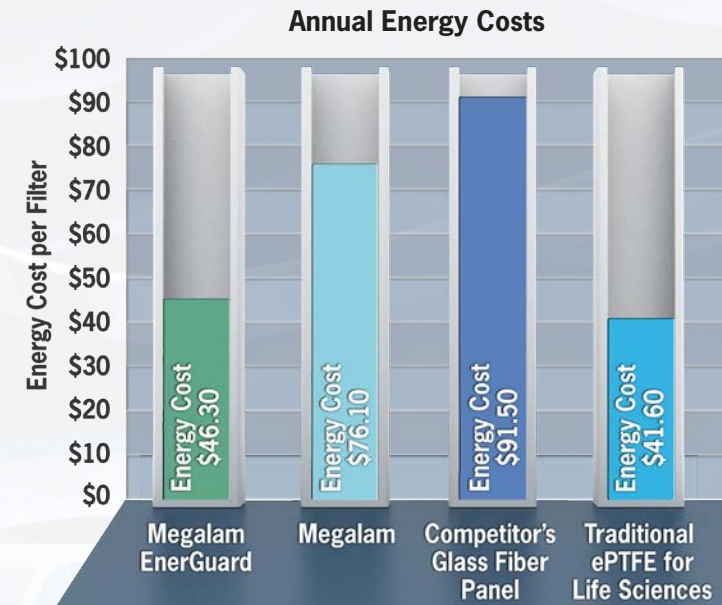
Typically 5-30% of glass fiber media filters are replaced at installation due to inappropriate handling. Megalam EnerGuard will not only eliminate the expense of replacement filters and reduce the need for spares, but most importantly will reduce cleanroom downtime while waiting for re-installation and re-validation.



EnerGuard Installation Cost Comparison				
	Megalam EnerGuard <1%	Other HEPA Filters 10-30%		
Failure Rate	0%	10%	20%	30%
Filters Failed	0	10	20	30
Replacement Filter Costs	0	\$3,000	\$6,000	\$9,000
Process Downtime (during replacement)	*0 weeks	1-2 weeks	1-2 weeks	1-2 weeks
Installation and Certification Cost per Filter	**\$300	**\$300	**\$300	**\$300
Total Reinstallation and Recertification Costs	0	\$3,000	\$6,000	\$9,000
<b>Total Reinstallation Costs</b>	<b>\$0</b>	<b>**\$6,000</b>	<b>**\$12,000</b>	<b>**\$18,000</b>

\*Assumes 1 spare will be available at time of initial installation \*\*Installation \$150/filter; Certification \$150/filter

### MEGALAM ENERGUARD VERSUS ALTERNATIVES



### ENERGY SAVINGS UP TO 50%

The costs of circulating and cleaning air are often the highest operating expense in a modern cleanroom. Megalam EnerGuard features significantly lower energy consumption compared to traditional glass fiber filters and lower total cost of ownership (TCO) than ePTFE filters.

“ EnerGuard offers up to 40% lower TCO vs. competitor's glass, and 60% lower TCO vs. ePTFE. ”

### Total Cost of Ownership over 10 Years of Service Life (\*based on 100 filter installations)



TCO is based upon applications that require regular testing by an aerosol challenge. Installation failure rates of 10% and 20% presumed for Megalam glass and competitor's glass, respectively.

All calculations assume 2'x4' panel filters of 2" filter media depth and H14 efficiency.

## PROSAFE MEANS PROCESS SAFETY — YOUR PROCESS SAFETY

The life sciences industry faces tough demands in achieving clean air. Be careful choosing an air filter. The filter must protect your products from particulate contamination, and must prevent undesirable materials from entering into your process.

When you see the ProSafe symbol, you know the filter has been made with qualified materials that offer the maximum process safety. There is full material and process traceability and control.

- ▶ Designed for process safety.
- ▶ Every filter is scanned and leak tested at the factory.
- ▶ Thorough qualification and testing of all raw materials.
- ▶ ISO 846 approved (for microbial inertness).
- ▶ VDI6022 approved for moisture and corrosion resistance in hygienic HVAC applications.
- ▶ Chemical inertness to all common cleaning agents.
- ▶ Formaldehyde, phthalate, and bisphenol A (BPA)-free materials.

**PRO  
SAFE**

Air filters for sensitive processes

## EFFICIENCIES AND OFFERINGS

Available in efficiencies of 99.95% (H13), 99.995% (H14), and 99.9995% (U15) @ 0.1-0.2 µm.

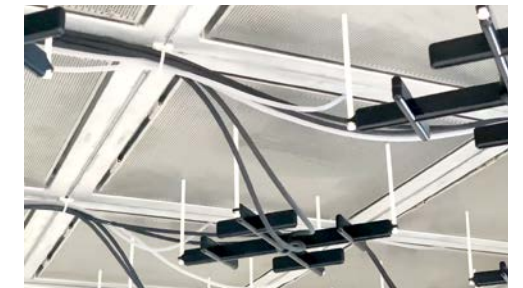
# Megalam® EnerGuard™ Development



Camfil's HEPA Filter Lifetime Test Grid Riverdale, New Jersey. (Above) The grid monitors all key performance characteristics of the test filters, nine of which can be simultaneously tested not for hours or days but weeks and months, to develop a scientifically-derived predictive model. (Photo to right shows internal grid sensing system)

## HEPA Filter Lifetime Test Grid

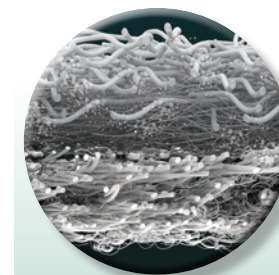
Camfil has created a new HEPA filter lifetime test grid to assist the Megalam EnerGuard development effort and provide the most scientifically-advanced HEPA filter analysis in the world. Camfil can control the airflow, particulate contamination concentration, temperature, humidity, scan test and filter challenge simulations, as well as most other variables affecting a filter's service life.



## Testing Acquisitions and Upgrades

For decades, Camfil's market position has been that of leadership through science and application analysis. In addition to the grid, see above, Camfil has augmented its technical leadership with recent acquisitions and upgrades.

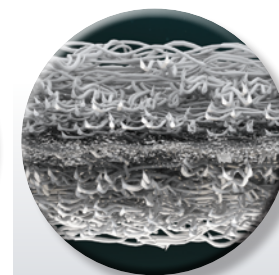
- ▶ Solid particle and oil aerosol loading apparatus: accelerates loading of flat sheet media samples
- ▶ Flat sheet discharge chamber: analyzes performance of flat sheet media samples
- ▶ Laser Aerosol Spectrometer: characterizes aerosol and particulate pollution
- ▶ Automated Filter Tester: determines filter efficiencies and most penetrating particle sizes
- ▶ Scanning Electron Microscope (SEM): examines materials down to nanometer sizes.
- ▶ Gas Chromatograph: Mass Spectrometer with Thermal Desorption and Headspace capability. Analyzes materials for outgassing characteristics



Megalam EnerGuard



Glass Fiber



ePTFE

Photorealistic renderings of cutaway, microscopic media depicting Camfil's Megalam EnerGuard media, traditional glass fiber media, and ePTFE. As illustrated here, the multifunctional fiber design of Megalam EnerGuard allows for depth loading of particulate contamination — a significant contrast to ePTFE membranes.

## Continuous Innovation, Technology & Research

Camfil invests heavily in research and development because it is a very important part of our future and the future of air filtration. With numerous labs and testing capabilities around the world, Camfil is able to analyze performance requirements and use the information to develop the best filtration system for your needs.

## **CAMFIL is a world leader in air filters and clean air solutions.**

For more than half a century, Camfil has been helping people breathe cleaner air. As a leading manufacturer of premium clean air solutions, we provide commercial and industrial systems for air filtration and air pollution control that improve worker and equipment productivity, minimize energy use, and benefit human health and the environment.

We firmly believe that the best solutions for our customers are the best solutions for our planet, too. That's why every step of the way – from design to delivery and across the product life cycle – we consider the impact of what we do on people and on the world around us. Through a fresh approach to problem-solving, innovative design, precise process control and a strong customer focus, we aim to conserve more, use less and find better ways – so we can all breathe easier.

The Camfil Group is headquartered in Stockholm, Sweden, and has 30 manufacturing sites, six R&D centers, local sales offices in 30 countries, and 4,500 employees and growing. We proudly serve and support customers in a wide variety of industries and in communities across the world. To discover how Camfil can help you to protect people, processes and the environment, visit us at [www.camfil.us](http://www.camfil.us).



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For further information, please contact your nearest Camfil office.