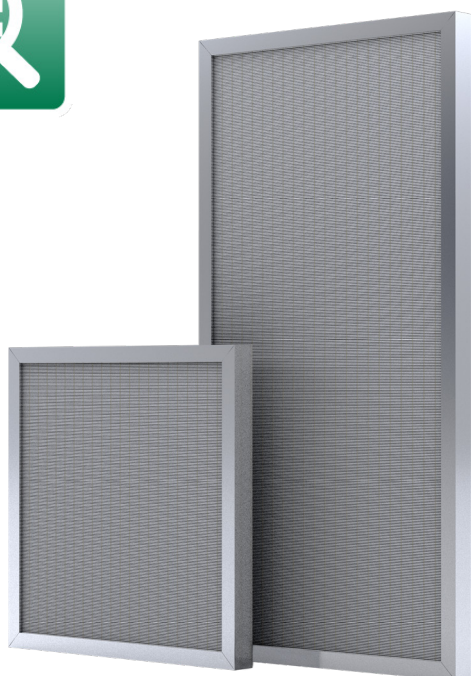


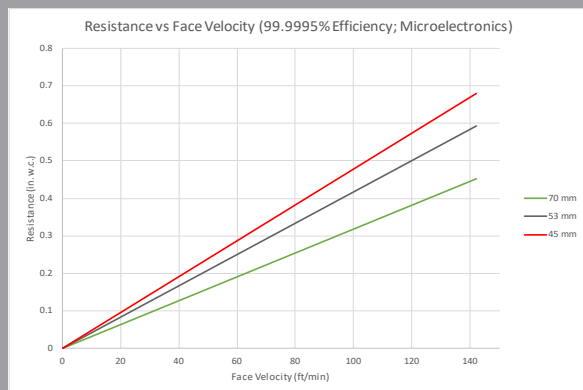


Megalam® EnerGuard™

HEPA/ULPA Mini-Pleat Panel Filters for Microelectronics Applications



A robust, durable, energy-saving HEPA/ULPA filter for sensitive microelectronic clean room applications



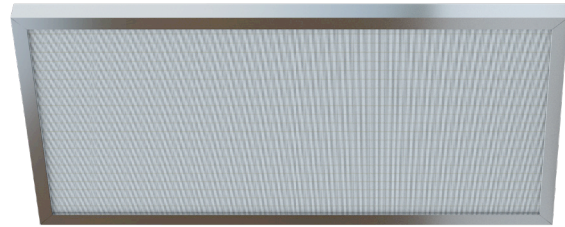
The above chart shows initial resistance with 99.9995% efficiency Megalam EnerGuard, panel, for resistance values for other efficiencies please contact factory.

The Megalam EnerGuard is a low outgassing, boron-free panel filter with depth loading capacity from a distinctive structure of multifunctional polymer fibers providing micron, sub-micron, and nanoparticle filtration. It provides fine airborne particulate control to meet the requirements for semiconductor, microelectronic, wafer, and photolithography areas providing cleanroom environments. With configuration and performance flexibility, the Megalam EnerGuard panel will provide the highest level of protection for product, processes and personnel. Each Camfil Megalam EnerGuard Filter includes:

- Energy cost savings - The filter has a low initial resistance to airflow and a maintained low pressure drop over its life translating to energy savings for the end user.
- Handling forgiveness - Contrary to the fragility of some media types, the EnerGuard has durability and physical robustness to mitigate the possibility of damage during shipment, transport, installation, or incidental contact during maintenance.
- High particulate capacity for long life - The media's depth loading capability guarantees it will not prematurely load with either aerosols or solids. The media's efficiency curve vs. loading is shaped similar to that of glass media, ensuring a long functional life.
- Ultra-low outgassing media - Will protect your process from unwanted chemical reactions. The media is boron free, protecting multiple critical process steps where fugitive boron is a major concern.
- Camfil's controlled media spacing technology - It ensures optimized filter element depth and pleat spacing resulting in minimized configuration losses and maintained low resistance to airflow.
- Thermoplastic resin media separators - Ensuring uniform pleat spacing and forming a rigid, self-supported media pack.
- A heavy-duty, lightweight anodized aluminum frame - For high-strength and ease of installation. The frame corners are secured with Camfil's exclusive Klip-Lok mechanism for module durability and long-term integrity.

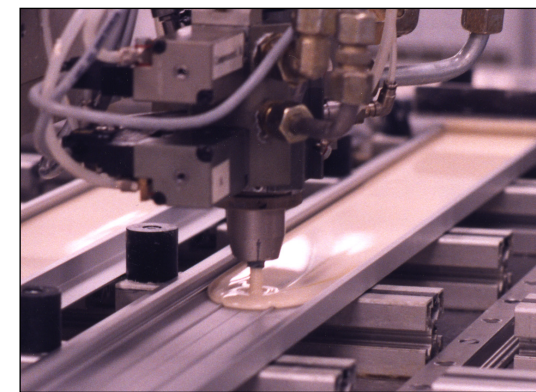
The Camfil Megalam EnerGuard filter for microelectronics:

- Is tested using Camfil's Auto-Scan automated leak detection system. Filters are serialized, bar coded, and all actual unit performance test results including efficiency, airflow, and initial pressure drop are provided on a three part label.
- Is available in efficiencies of 99.99%, 99.995%, and 99.9995%.
- Is available in pack depths that include 45mm, 53mm, and 70mm.
- The Megalam EnerGuard for microelectronics should NOT be challenged with oil aerosols, but polystyrene latex (PSL) spheres.



Camfil Energuard filter is unique in that it provides the required filtration efficiency, offers the lowest resistance to airflow and is durable to resist damage from contact during filter service, installation or application.

It is available in efficiencies of 99.99%, 99.995% and 99.9995% to suit the most demanding of microelectronics applications. Depending upon ceiling coverage and air change rate it may provide an ISO clean room class level environment from Class 8 to Class 3.



Advanced Sealing Techniques

The filter pack to frame seal plays a vital role in filter integrity. Urethane must be mixed and dispensed with absolute precision in order to create a leak free seal that remains integral for long term usage. Camfil's polyurethane is the industry's lowest outgassing sealant. Every batch is subjected to rigorous quality assurance testing prior to use, assuring the highest degree of integrity and stability for the life of the filter.

Advanced Pleating Techniques

Basic performance of any high efficiency filter is a function of the pleated filter element. Pleat formation must be controlled with absolute precision and must be consistent throughout. Camfil's pleating techniques eliminate media to media contact and associated fiber break-off common to other industry techniques. Camfil designs and builds its own pleating equipment to ensure product consistency and performance.



Gasket Seal

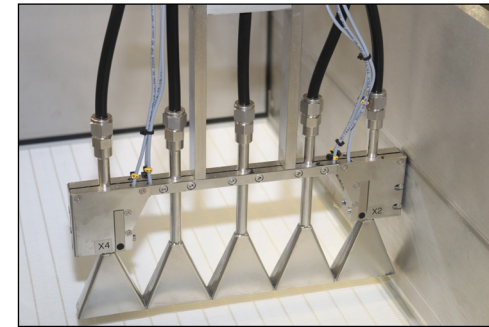
The most common sealing technique is a gasket seal. Camfil offers clean room seamless foam gaskets, applied to either the upstream or downstream flange. The gasket is compressed between an opposing flange mating surface on the ceiling grid, housing or equipment.

Knife Edge Seal

Megalam panels are also available in a frame with an integral knife edge. The knife edge interfaces with a gel channel that is integral to the ceiling grid or equipment. This technique is frequently seen in common plenum applications where the weight of the filter and pressure from airflow is all that is needed to affect a positive seal — no mounting hardware is required.

Gel Seal

A common optional sealing technique is gel seal. The filter frame is designed with an integral gel channel that is filled with a low outgassing polyurethane based gel. The gel interfaces with an opposing knife edge integral to the ceiling grid, housing, or equipment. The gel offers a fluid seal integrity that makes it a good choice for filters that are difficult to install or frequently replaced. This technique is most often seen in "bottom loading" or "room side replaceable" applications.



The filter receives a bar coded identification label with actual test results of airflow rate, initial pressure drop, and measured efficiency.

Camfil's exclusive Auto-Scan automated leak detection system provides a superior apparatus for filter performance evaluation. Precision, location and movement of the computer controlled robotic arm ensures that the entire filter face, including the media to frame seal, is scanned. When the filter passes this test, the test data is recorded to a master database. After placement of Camfil's "Scanned" label, an indication of the highest quality filter, the Megalam is bagged for purity and sealed for shipment.

The Clean Way

Our Megalam panel filters are manufactured in an ISO 7 (Class 10,000) environment to ensure product cleanliness. Every Megalam is tested in a space that is maintained at ISO 5 (Class 100). Our manufacturing personnel are gowned in frocks and hoods and are trained in industry clean room protocol. All procedures are governed by our ISO 9001-2015 certified quality system so that every filter produced is of the highest quality.



Performance Data

Model Number	Part Description	Actual Width (Inches)	Actual Length (Inches)	Actual Height (Inches)	Initial Resistance (inches w.g.)	Shipping Weight (lbs.)
99.99%						
N2424.00-48.00D1-03-00-00-00-0	Megalam EG MicroE 99.99% 45mm	24	48	3.00 (45mm)	0.28	15.7
N2448.00-48.00D1-03-00-00-W0-0	Megalam EG MicroE 99.99% 45mm	48	48	3.00 (45mm)	0.28	26.8
N2424.00-48.00-5-03-00-00-00-0	Megalam EG MicroE 99.99% 53mm	24	48	3.00 (53mm)	0.25	17.1
N2448.00-48.00-5-03-00-00-W0-0	Megalam EG MicroE 99.99% 53mm	48	48	3.00 (53mm)	0.25	23.3
N2424.00-48.00-9-14-00-00-00-0	Megalam EG MicroE 99.99% 70mm	24	48	3.54 (70mm)	0.19	20.7
N2448.00-48.00-9-14-00-00-U0-0	Megalam EG MicroE 99.99% 70mm	48	48	3.54 (70mm)	0.19	38.6
99.995%						
N2524.00-48.00D1-03-00-00-00-0	Megalam EG MicroE 99.995% 45mm	24	48	3.00 (45mm)	0.38	15.7
N2548.00-48.00D1-03-00-00-W0-0	Megalam EG MicroE 99.995% 45mm	48	48	3.00 (45mm)	0.38	26.8
N2524.00-48.00-5-03-00-00-00-0	Megalam EG MicroE 99.995% 53mm	24	48	3.00 (53mm)	0.33	17.1
N2548.00-48.00-5-03-00-00-W0-0	Megalam EG MicroE 99.995% 53mm	48	48	3.00 (53mm)	0.33	23.3
N2524.00-48.00-9-14-00-00-00-0	Megalam EG MicroE 99.995% 70mm	24	48	3.54 (70mm)	0.25	20.7
N2548.00-48.00-9-14-00-00-U0-0	Megalam EG MicroE 99.995% 70mm	48	48	3.54 (70mm)	0.25	38.6
99.9995%						
N2624.00-48.00D1-03-00-00-00-0	Megalam EG MicroE 99.9995% 45mm	24	48	3.00 (45mm)	0.48	15.7
N2648.00-48.00D1-03-00-00-W0-0	Megalam EG MicroE 99.9995% 45mm	48	48	3.00 (45mm)	0.48	26.8
N2624.00-48.00-5-03-00-00-00-0	Megalam EG MicroE 99.9995% 53mm	24	48	3.00 (53mm)	0.42	17.1
N2648.00-48.00-5-03-00-00-W0-0	Megalam EG MicroE 99.9995% 53mm	48	48	3.00 (53mm)	0.42	23.3
N2624.00-48.00-9-14-00-00-00-0	Megalam EG MicroE 99.9995% 70mm	24	48	3.54 (70mm)	0.32	20.7
N2648.00-48.00-9-14-00-00-U0-0	Megalam EG MicroE 99.9995% 70mm	48	48	3.54 (70mm)	0.32	38.6

DATA NOTES:

Maximum operating temperature 160° F (71° C). Maximum 90% RH.
 Camfil Megalam EnerGuard panels are listed by Underwriters Laboratories as UL 900.
 Recommended final resistance, double initial resistance maximum or 2.0" w.g.
 Shipping weight based upon single pack.



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Active face area should be exclusive of the filter frame. The gasket seal version of the Megalam has an extruded aluminum frame with an industry standard 3/4 inch flange that results in active face dimensions 1-1/2 inches smaller than overall face dimensions. An additional subtraction must be made if a center divider is present. Some manufacturers may base their calculations on overall dimensions which may provide misleading data. When comparing products make sure performance data is provided in a consistent format. Example:

$$Q = VA = ?$$

$$A = \{24-(2 \times 0.75)\} \times \{48-(2 \times 0.75)\} = 7.27 \text{ ft}^2$$

so:

$$\text{If } V = 100 \text{ fpm then } Q = 727 \text{ cfm}$$

Where:

Q = VA, Q= volumetric flow rate

V = filter face velocity

A = active face area

Megalam Panel Filter Specifications

Air Filters—1.0 General

1.1 - Air filters shall be high-efficiency, individually tested and certified panel filters consisting of aluminum enclosing frame, low-outgassing sealant, hot melt pleat separators and polymeric media filter pack.

1.2 - Sizes shall be as noted on drawings or other supporting materials. Resistance to airflow (@100fpm) shall not exceed 10% of the target value listed on that schedule.

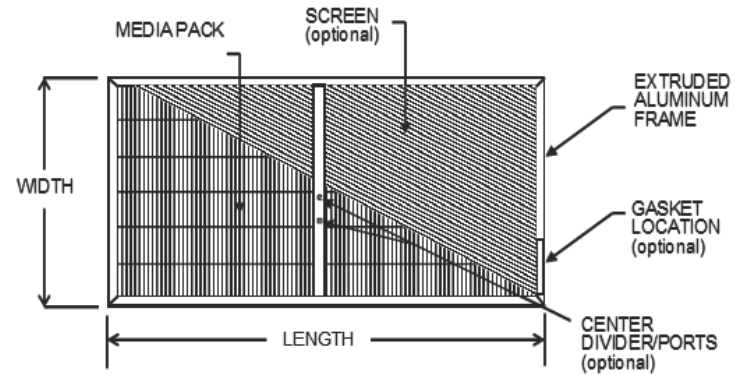
2.0 Construction

2.1 - Filter shall be manufactured in an ISO 7 (Class 10,000) cleanroom and tested in an ISO 5 (Class 100) clean space.

2.2 - Filter shall be one continuous pleating of multifunctional polymer fibers and no membrane, allowing for depth loading capability comparable to glass fiber media, and formed into a uniform pack depth of 45mm, 53mm or 70mm. The filter shall be resistant to damage from finger poke pressure tests.

2.3 - Pleat spacing shall be by thermoplastic resin separators to prevent media-to-media contact and promote uniform airflow through the media pack.

2.4 - The media pack shall be completely encapsulated in a polyurethane



Available Options (Consult factory for availability and pricing.):

Various framing materials and additional configurations are available for mounting into a wide variety of ceiling grid, housings and equipment configurations.

Center dividers and additional access ports.

Gaskets, profile and materials.

Face screens, various finishes and materials.

sealant creating a rigid self-supporting pack. The sealant shall be low out gassing, phosphorous free, fire-resistant and self-extinguishing.

2.5 - The enclosing frame, of anodized aluminum profiles, shall be joined together with secure internal corner clips to form a rugged and durable enclosure. Overall dimensional tolerance shall be correct within +0, -1/8", and square within 1/4".

2.6 - Gaskets, unless otherwise noted, shall be low outgassing seamless cellular urethane foam.

3.0 Performance

3.1 - The filter shall be identified by a three part printed label (not handwritten) indicating individual unit identification, bar code serialization, and actual unit performance test results including efficiency, airflow, and initial pressure drop.

Filter shall be Camfil Megalam EnerGuard ME.

* Items in parentheses () require selection.



For detailed specifications please consult your local Camfil Distributor, Representative or www.camfil.us.

Camfil has a policy of uninterrupted research, development, and product improvement. We reserve the right to change designs and specifications without notice.



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