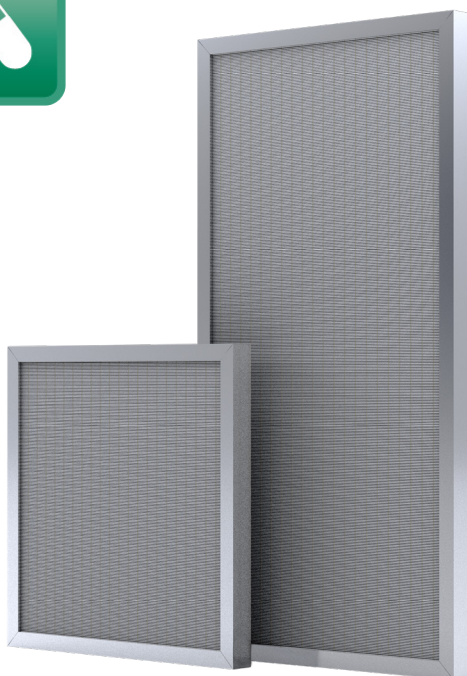




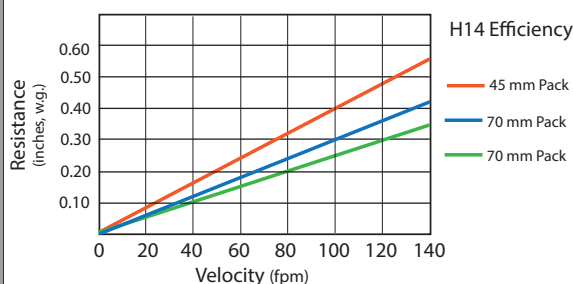
Megalam® EnerGuard™

HEPA/ULPA Mini-Pleat Panel Filters for Life Sciences Applications



A robust, durable, energy-saving HEPA/ULPA filter for sensitive Life Sciences cleanroom applications

Initial Resistance Versus Airflow
Camfil Megalam EnerGuard



The above chart shows initial resistance with H14 efficiency Megalam EnerGuard, panel, for resistance values for other efficiencies please contact factory.

The Megalam EnerGuard is an innovative HEPA filter featuring polymeric media with a distinctive structure of multi-functional fibers providing micron, sub-micron, and nano particulate filtration. It provides fine airborne particulate control to meet the requirements for pharmaceutical manufacturing facilities requiring cleanroom environments. With configuration and performance flexibility, the Megalam EnerGuard will provide the highest level of protection for product, processes and personnel. Each Camfil Megalam EnerGuard offers:

- 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 filter 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 loading capacity for long life - The filter's depth loading capability guarantees it will not prematurely load with either aerosols or solids. The filter's efficiency curve vs. loading is shaped similar to that of glass media filters, ensuring regulatory compliance and a long functional life.
- 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 filter 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.

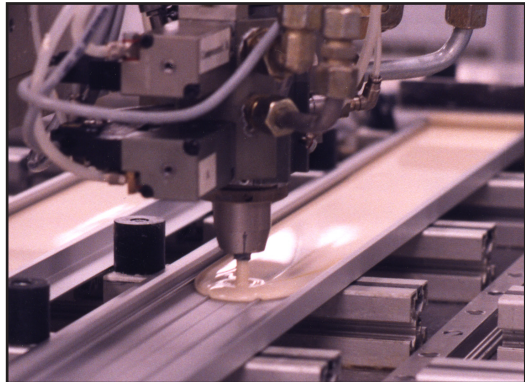
The Camfil Megalam EnerGuard filter:

- Is tested using Camfil's Auto-Scan automated leak detection system. Filters are serialized, bar coded, and all significant data is provided on a label on the filter.
- Is available in efficiencies of 99.95% (H13), 99.995% (H14), and 99.9995% (U15).
- Is available in pack depths that include 45mm, 53mm, and 70mm.



The 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 99.95% (H13), 99.995% (H14) and 99.9995% @ 0.1-0.2 microns (U15) to suit the most demanding of Life Sciences applications. Depending upon ceiling coverage and air change rates it may provide a cleanroom environment from ISO 8 to ISO 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. Urethane installation is automated for accurate dispensing and consistency. Camfil 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

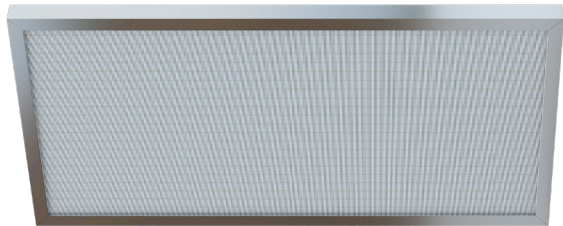
The most common sealing technique is a gasket seal. Camfil offers cleanroom seamless foam gaskets, applied to either the upstream or downstream flange. The gasket is compressed between an opposing flange mating surface on the ceiling grid, housing or equipment.

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

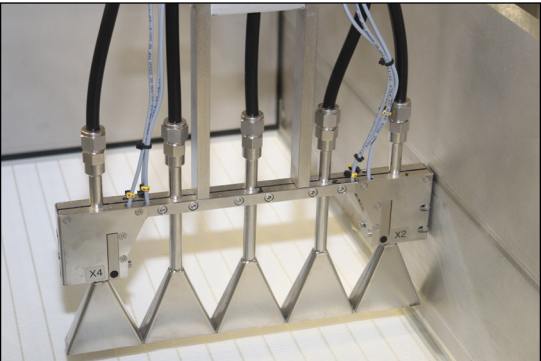
A common optional sealing technique is gel seal. The filter frame is designed with an integral gel channel that is filled with a low outgassing polyurethane, silicone, and proprietary blend gels. The gel interfaces with an opposing knife edge integral to the ceiling grid, housing, or equipment. The gel 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.



Megalam® EnerGuard™ HEPA/ULPA Panel Filters for Life Sciences Applications

Advanced Testing Techniques

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 filter to frame seal, is scanned. When the filter passes this test, the test data is recorded to a master database. The filter receives a bar coded identification label complete with minimum efficiency, target pressure drop, tested airflow, and actual measured efficiency and actual measured pressure drop.. After placement of Camfil's “Scanned” label, indication of the highest quality filter, the Megalam EnerGuard is bagged for purity and sealed for shipment.



The Clean Way

Our Megalam EnerGuard panel filters are manufactured in an ISO 7 environment (Class 10,000) to ensure product cleanliness. Every Megalam EnerGuard 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 cleanroom 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.) @ 0.3 micron"	Shipping Weight (lbs.)
H13						
N2124-24D1-03-00-00-00-0	Megalam EG LS H13 45mm	24	24	3.00 (45mm)	0.29	12
N2124-48D1-03-00-00-00-0	Megalam EG LS H13 45mm	24	48	3.00 (45mm)		22
N2124-24-5-03-00-00-00-0	Megalam EG LS H13 53mm	24	24	3.00 (53mm)	0.26	12
N2124-48-5-03-00-00-00-0	Megalam EG LS H13 53mm	24	48	3.00 (53mm)		22
N2124-24-9-14-00-00-00-0	Megalam EG LS H13 70mm	24	24	3.54 (70mm)	0.20	18
N2124-48-9-14-00-00-00-0	Megalam EG LS H13 70mm	24	48	3.54 (70mm)		28
H14						
N2224-24D1-03-00-00-00-0	Megalam EG LS H14 45mm	24	24	3.00 (45mm)	0.36	12
N2224-48D1-03-00-00-00-0	Megalam EG LS H14 45mm	24	48	3.00 (45mm)		22
N2224-24-5-03-00-00-00-0	Megalam EG LS H14 53mm	24	24	3.00 (53mm)	0.32	12
N2224-48-5-03-00-00-00-0	Megalam EG LS H14 53mm	24	48	3.00 (53mm)		22
N2224-24-9-14-00-00-00-0	Megalam EG LS H14 70mm	24	24	3.54 (70mm)	0.25	18
N2224-48-9-14-00-00-00-0	Megalam EG LS H14 70mm	24	48	3.54 (70mm)		28
U15						
N2324-24D1-03-00-00-00-0	Megalam EG LS U15 45mm	24	24	3.00 (45mm)	0.48	12
N2324-48D1-03-00-00-00-0	Megalam EG LS U15 45mm	24	48	3.00 (45mm)		22
N2324-24-5-03-00-00-00-0	Megalam EG LS U15 53mm	24	24	3.00 (53mm)	0.42	12
N2324-48-5-03-00-00-00-0	Megalam EG LS U15 53mm	24	48	3.00 (53mm)		22
N2324-24-9-14-00-00-00-0	Megalam EG LS U15 70mm	24	24	3.54 (70mm)	0.32	18
N2324-48-9-14-00-00-00-0	Megalam EG LS U15 70mm	24	48	3.54 (70mm)		28

DATA NOTES:
Maximum operating temperature 160° F (72° C). Maximum 99% RH.
Camfil Megalam EnerGuard panels are listed by Underwriters Laboratories as UL 900.
Recommended final resistance, double initial resistance or a maximum of 2.0" w.g.
Shipping weight based upon single pack.

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:

$$Q = VA = ?$$

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

so:

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

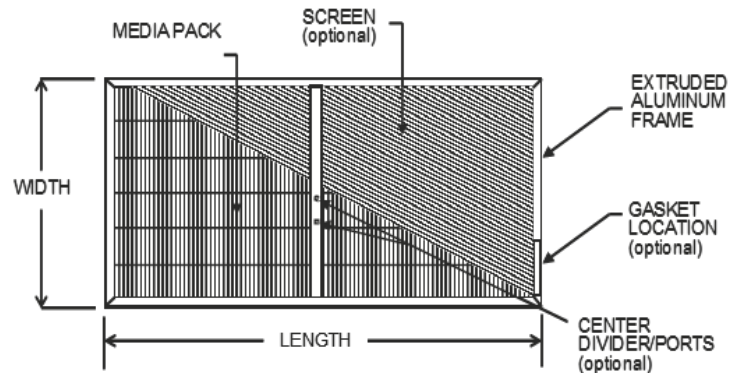
Where:

$Q = VA$, Q = volumetric flow rate

V = filter face velocity

A = active face area

For more information ask for Camfil technical bulletin on airflow.



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.

Consult factory for availability and pricing.

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 fiber filter pack.

1.2 - Sizes shall be as noted on drawings or other supporting materials. Resistance to airflow shall not exceed values 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 media shall be one continuous pleating of polymeric fiber formed into a uniform pack depth of (45, 53, 70)* mm. The filter shall be resistant to damage during installation, service and application.

2.3 - The filter shall be low outgassing — <1 ppm (TD-GC-MS, 50° C for 30 min.).

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

2.5 - The filter pack shall be completely encapsulated in a polyurethane sealant creating a rigid self supporting pack. The sealant shall be low outgassing, phosphorous free, fire resistant and self-extinguishing.

2.6 - 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".

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

3.0 Performance

3.1 - The filter shall be identified on a label indicating minimum efficiency, target pressure drop, tested airflow, and actual measured efficiency and actual measured pressure drop. The unit shall be bar code serialized for individual unit identification.

Filter shall be Camfil Megalam EnerGuard LS.

* Items in parentheses () require selection.

