

# RFM22

Welded terminal filter module for pharmaceutical or biotech applications.



Maintain critical room side clean space with a leak free welded terminal filter housing.

Photo shows full size RFM22 module with ceiling trim.  
Filter not shown, order separately (see page 3 or contact Camfil Farr).



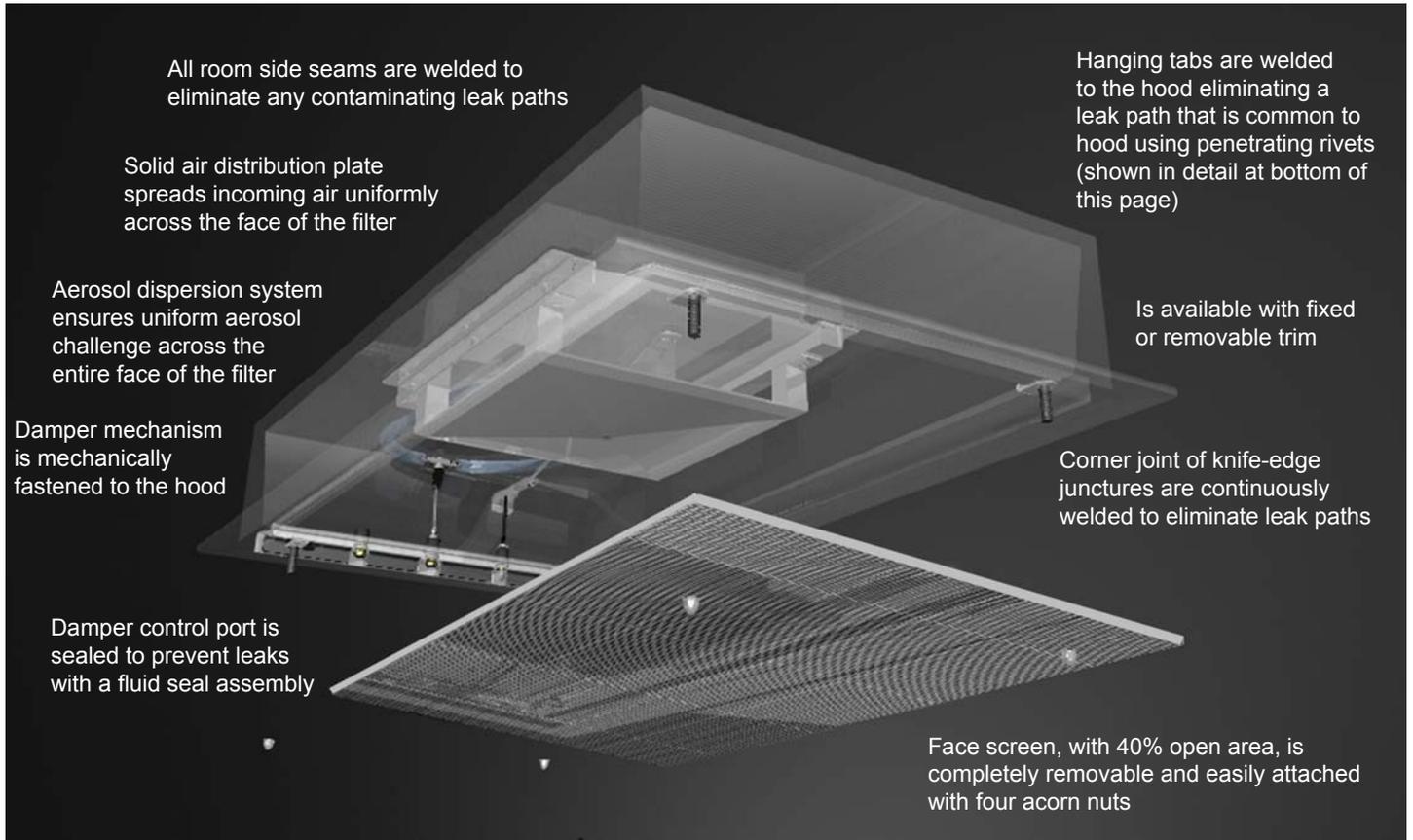
The Camfil Farr RFM22 is a ducted terminal hood that incorporates a gel seal filter and is designed specifically for applications where hoods are regularly certified for performance and leak-free operation. The RFM22:

- Is constructed of aluminum with welded seams on the room side to eliminate leak paths and ensure structural rigidity.
- Incorporates a knife-edge for the installation of gel channel HEPA or ULPA filters.
- Includes a radial blade damper for air volume control, an optional guillotine damper is also available.
- Includes a 12" round inlet for connection to air supply on full size module and a 10" round inlet connection on half size module.
- Distributes air evenly across the filter surface through the use of a solid air distribution plate.
- Includes threaded studs with filter retention tabs that simplify filter service and change from the room side.
- Includes a removable stainless steel face grille, with 40% open area, through the use of four corrosion resistant stainless steel acorn nuts.
- Includes an aerosol dispersion ring for localized aerosol injection.
- Includes a static pressure port for evaluating filter pressure drop or sampling of the upstream aerosol concentration during filter scan testing. This allows easy service from the room side for filter change, airflow adjustment and filter scan testing.
- May be installed in standard t-bar ceilings, gel-grid systems, and hardboard or plaster systems.
- Is an excellent direct replacement for existing competitive module installations.

The Camfil Farr RFM22 provides the filtration solution for pharmaceutical or biotech applications where cleanliness levels from Class ISO 5 to ISO 8 are a requirement.

Camfil Farr	Product sheet
RFM22	3419 - 1008
Camfil Farr - clean air solutions	

## Camfil Farr RFM22



•	Aerosol port is a female NPT fitting and includes nylon sealing plug.
•	Grille has a solid border, no raw edges to damage filters or personnel when servicing filters
•	Knife-edge design ensures that filter will not bottom out in the track eliminating metal to metal contact and potential bypass.
•	Collar is ribbed to ensure secure duct connection.
•	Aerosol injection and static pressure measurement ports are labeled.
•	All pressure boundaries on the room side are soap-bubble tested.
•	Every hood is pressure tested to 3.0" w.g. to ensure a leak free housing and integrity of the cleanspace. Each unit is serialized for quality control.

Unit is shipped with a radial blade damper to control airflow between 20% flow and 80% ( $\pm 5\%$ ) of airflow.



An optional guillotine damper is also available to control air from 20% flow to full flow.



Hanging tabs are welded to each corner of the unit for ease of suspension/installation.

Model	Dimensions Outside Trim (inches)	Body Depth (inches)	Inlet Size (inches)	Ceiling Type	Installed Weight w/o Filter (lbs)
Radial Blade Damper					
RFM22-25D25D-12D-F-B-10-R-TS-A-C-0-A-1-0-1	25- $\frac{1}{4}$ by 25- $\frac{1}{4}$	12- $\frac{1}{4}$	10" Round	Hard	35
RFM22-25D49D-12D-F-B-12-R-TS-A-C-0-A-1-0-1	25- $\frac{1}{4}$ by 49- $\frac{1}{4}$	12- $\frac{1}{4}$	12" Round		45
Guillotine Damper					
RFM22-25D25D-12D-F-G-10-R-TS-A-C-0-A-1-0-1	25- $\frac{1}{4}$ by 25- $\frac{1}{4}$	12- $\frac{1}{4}$	10" Round	Hard	35
RFM22-25D49D-12D-F-G-12-R-TS-A-C-0-A-1-0-1	25- $\frac{1}{4}$ by 49- $\frac{1}{4}$	12- $\frac{1}{4}$	12" Round		45
Radial Blade Damper					
RFM22-23J23J-12D-F-B-10-R-TS-A-A-0-A-1-0-1	23- $\frac{5}{8}$ by 23- $\frac{5}{8}$	12- $\frac{1}{4}$	10" Round	1.50"	35
RFM22-23J47J-12D-F-B-12-R-TS-A-A-0-A-1-0-1	23- $\frac{5}{8}$ by 47- $\frac{5}{8}$	12- $\frac{1}{4}$	12" Round	T-Bar	45
Guillotine Damper					
RFM22-23J23J-12D-F-G-10-R-TS-A-A-0-A-1-0-1	23- $\frac{5}{8}$ by 23- $\frac{5}{8}$	12- $\frac{1}{4}$	10" Round	T-Bar	35
RFM22-23J47J-12D-F-G-12-R-TS-A-A-0-A-1-0-1	23- $\frac{5}{8}$ by 47- $\frac{5}{8}$	12- $\frac{1}{4}$	12" Round		45

Filters for RFM22 (order separately)	Actual Size		Rate Airflow (cfm)	Initial Resistance (inches w.g.) (tolerance $\pm$ 20%)
	Width	Length		
53 mm (99.995 @ MPPS)				
HX-21.75-20.00-5-41-FU-00-00-0	21.75	20	233	0.52
HX-21.75-44.00-5-41-FU-00-00-0		44	554	
70 mm (99.995 @ MPPS)				
HX-21.75-20.00-9-40-FU-00-00-0	21.75	20	233	0.44
HX-21.75-44.00-9-40-FU-00-00-0		44	554	
100 mm (99.995 @ MPPS)				
HX-21.75-20.00-B-39-FU-00-00-0	21.75	20	233	0.36
HX-21.75-44.00-B-39-FU-00-00-0		44	554	

#### Camfil Farr Megalam panels for RFM22 modules:

- Are available in efficiencies from 95% @ 0.3 micron to 99.99995% @ MPPS. The media is pleated using Camfil Farr's Controlled Media Spacing™ technology. CMS™ ensures optimized filter element depth and pleat spacing resulting in minimized configuration losses and low resistance to airflow.
- Include continuous glass filament separators to ensure uniform pleat spacing. Media-to-media contact, and associated fiber break-off, is eliminated.
- Include a heavy-duty, lightweight anodized aluminum frame for high-strength and ease of installation.
- Are sealed on all four sides with a silicone sealant which is a fire-retardant, thermally/chemically stable sealant assuring leak-free integrity and low outgassing.
- Are manufactured in a cleanroom and tested in a clean space.
- Are tested using Camfil Farr's AUTO-SCAN™ automated leak detection system. Filters are serialized, bar coded, and all data is provided on a label on the filter.
- Are available in pack depths that include 53mm (2.1"), 70mm (2.8"), and 100mm (4.0").



Filters must be ordered separately.

## SPECIFICATIONS

This specification covers most options for the Pharmaseal Ducted Ceiling Module. Please delete any non-applicable part of the specification. **References to selectable items are in bold.**

## 1 - Hood &amp; Knife-Edge Construction

1.1 - The hood shall be constructed from **[0.063" aluminum, 16ga 304/L or 16ga 316/L]**. All joints shall be continuously welded to provide an air-tight seal, excluding the joint between the inlet collar and the hood body which will be intermediately welded and seal with DC 732 caulking or equivalent.

1.2 - The knife-edge design shall not allow the knife-edge to bottom out in the gel track of the filter.

1.3 - The filter shall be secured in place by field removable stainless steel fasteners and retainers.

**[Trim (2) options available (PICK 1)]**

## 2 - PT-Type Perimeter Trim

2.1 - Permanent perimeter trim shall be formed into the RFM22 hood body. The perimeter trim shall be 5/8" [15.9mm] wide and sharp edges shall be removed from the corners.

2.2 - Perimeter trim shall be suitable for T-bar ceiling system. The trim can provide a sealing surface to the T-bar with gasket (provided by the T-bar manufacturer) or with Dow Corning 732 or equivalent provided by the installer.

## 2 - SRT Removable Perimeter Trim Assembly

2.1 - Removable perimeter trim shall be fabricated from 14-gauge, **[304/L or 316/L]** stainless steel. Interfaces between adjacent side and end pieces shall be continuously welded to create a single assembly. The perimeter trim shall be **(1 1/2" [38.1mm] or 2" [50.8mm])** wide and the corners shall be radiused in order to eliminate sharp edges. Finish shall be #3.

2.2 - Perimeter trim shall be suitable for hard surface ceiling system. The flatness of the horizontal perimeter flange of the removable stainless steel trim must be within 1/16" (0.062") [1.6mm].

2.3 - Trim shall be field installed and attached to the hood body using closed-head rivets. Once hood is properly suspended and secured, trim is to be caulked and inserted into hood body. After confirming trim assembly is flush with ceiling, holes should be drilled through body using pre-cut guide holes in trim. If hood is properly installed, guide holes will align with welded penetration protection ring on hood body. This welded ring insures rivet penetration will not allow air to bypass the knife edge assembly and enter the clean space without passing through filter. Rivet heads should be caulked, but fully caulked knife edges only will not be accepted.

## 3 - Duct Connection

The hood shall have an integral duct connection collar for slip joint connection that extends an approx. of 3" [76.2mm] above the top surface. The collar shall have a raised rib to prevent flexible duct blow-off. The collar shall be intermediately welded and seal with DC 732 caulking or equivalent.

**[Damper (2) options available (PICK 1)]**

## 4 - Radial "Bow tie" Damper

4.1 - The hood shall incorporate a factory installed radial/bow tie type damper, fabricated of galvanized steel, and manually actuated through a control rod and mechanical linkage by means of a 9/16" nut driver or socket. The damper control rod shall be labeled.

4.2 - The damper control rod penetration through the knife-edge assembly shall maintain an air-tight seal after adjustment to the damper and shall not leak under the filter challenge perimeter test.

## 4 - Guillotine Damper

4.1 - The hood shall incorporate a factory installed guillotine-type damper, consisting of two blades that slide horizontally from open to closed position, and manually actuated through a control rod and mechanical linkage by means of a 9/16" nut driver or socket. The damper control rod shall be labeled.

4.2 - The damper blades and mechanisms shall be fabricated from stainless steel and/or aluminum.

4.3 - The damper control rod penetration through the knife-edge assembly shall maintain an air-tight seal after adjustment to the damper and shall not leak under the filter challenge perimeter test.

**[Test Port (2) options available (PICK 1)]**

## 5 - Standard Test Port

A labeled test port shall be provided through the knife-edge, which is accessible from the room side of the hood while the filter is installed and the grille removed. The test port is designed to measure the static pressure in the hood and to test the aerosol concentration in the hood upstream of the filter. The test port shall be sealed using a 1/8" NPT nylon plug (see spec 10).

## 5 - Quick Disconnect Test Port

A labeled test port shall be provided through the knife-edge, which is accessible from the room side of the hood while the filter is installed and the grille removed. The test port is designed to measure the static pressure in the hood and to test the aerosol concentration in the hood upstream of the filter. The test port shall be sealed using a 3/8" NPT chrome-plated brass Quick Disconnect with a snap-in barbed connector (see spec. 10).

**[Grille (4) options available (PICK 1)]**

## 6 - Flush Acorn Nut Grille

The grille shall be the flush-mounted type, manufactured from 20-gauge, perforated 304 stainless steel, 2B finish, with a minimum of 40% open area. The perimeter flange of the grille shall be solid, unperforated and not hemmed for standard 2x2 and 2x4 hoods, or shall be perforated and hemmed for nonstandard sizes. The grille shall utilize stainless steel threaded studs, and stainless steel acorn nuts and washers to secure the grille without the use of tools.

## 6 - Flush Hinge With Acorn Nut Grille

The grille shall be the flush-mounted type, manufactured from 20-gauge, perforated 304 stainless steel, 2B finish, with a minimum of 40% open area. The perimeter flange of the grille shall be solid, unperforated and not hemmed for standard 2x2 and 2x4 hoods, or shall be perforated and hemmed for nonstandard sizes. One side of the grille shall be hinged using stainless steel hinges which allow for grille removal in the field without requiring the use of tools. The opposite side of the grille shall utilize stainless steel threaded studs, and stainless steel acorn nuts and washers to secure the grille without the use of tools.

## 6 - Flush Hinge With 1/4 Turn Fastener Grille

The grille shall be the flush-mounted type, manufactured from 20-gauge, perforated 304 stainless steel, 2B finish, with a minimum of 40% open area. The perimeter flange of the grille shall be solid, unperforated and not hemmed for standard 2x2 and 2x4 hoods, or shall be perforated and hemmed for nonstandard sizes. One side of the grille shall be hinged using stainless steel hinges which allow for grille removal in the field. The opposite side of the grille shall utilize stainless steel 1/4-turn fasteners to secure the grille.

## 6 - Flush Hinge With 1/4 Turn Fastener and Safety Chain Grille

The grille shall be the flush-mounted type, manufactured from 20-gauge, perforated 304 stainless steel, 2B finish, with a minimum of 40% open area. The perimeter flange of the grille shall be solid, unperforated and not hemmed for standard 2x2 and 2x4 hoods, or shall be perforated and hemmed for nonstandard sizes. One side of the grille shall be hinged using stainless steel/aluminum hinges which allow for grille removal in the field. The opposite side of the grille shall utilize stainless steel 1/4-turn fasteners to secure the grille. The grille is also to have a stainless steel safety chain to prevent the grille from accidentally opening more than 8 inches.

## 7 - Hanging Tabs

Hanging tabs shall be fabricated from [0.063" aluminum or 16ga 304/L] and permanently welded to the hood.

**[Aerosol Dispersion (2) options available (PICK 1)]**

## 8 - Standard Aerosol Dispersion System

The knife-edge assembly shall include a labeled port to inject challenge aerosol into the plenum upstream of the filter. The dispersion system shall be permanently attached to the knife-edge assembly by continuously welding. A nylon plug shall be supplied to seal this port (see spec. 10).

## 8 - Quick Disconnect Aerosol Dispersion System

The knife-edge assembly shall include a labeled port to inject challenge aerosol into the plenum upstream of the filter. The dispersion system shall be permanently attached to the knife-edge assembly by continuously welding. The aerosol port shall be sealed using a 3/8" NPT chrome-plated brass Quick Disconnect with a snap-in barbed connector (see spec. 10).

## 9 - Distribution Plate

The hood shall include a solid distribution plate, located in the plenum area downstream of the inlet collar, to break up the air as it enters the plenum, thereby providing uniform air flow through the filter.

**[Barbed connectors (2) options available (PICK 1)]**

## 10 - Nylon Barbed Connector for Standard Ports

Nylon barbed connector shall be shipped loose with order. One (1) per every twenty (20) hoods.

## 10 - Snap-in Barbed Connector for Quick Disconnects

The following quantity of snap-in barbed connectors will be shipped loose with order.

- 1 set of 2 barbed connectors for orders up to 50 hoods.
- 2 sets of 2 barbed connectors for orders 51 to 150 hoods.
- 3 sets of 2 barbed connectors for orders 151 hoods and above.

## 11 - Foil Back Insulation

Hood shall be insulated externally; both top and sides, with 2" [50.8mm] thick foiled back insulation held in place with 3" [76.2mm] aluminum foil tape and Tac-Toos.

## 12 - Quality Assurance &amp; Factory Testing

12.1 - Hoods shall be manufactured under a quality program that has been assessed and independently certified to meet the requirements of ISO 9001:2000 for the design, manufacture and distribution of containment and HVAC air filtration products. The certification shall be valid during the time frame in which the hoods are manufactured.

12.2 - All hoods shall be visually inspected for: pinholes, porosity, excessive indentations, inclusions, or weld build-up.

12.3 - Each hood shall be leak tested per Camfil Farr Work Instruction #CFWSP-5001. The knife-edge shall be sealed off with a jig and the hood plenum area pressurized to 3" w.g. [0.75kPa]. All welds in the knife-edge area (ROOM SIDE ONLY) and all penetrations such as the damper control rod, static and aerosol ports will be bubble-tested for leaks. Each hood shall be serialized, and a Certificate of conformance shall be provided to show that each hood meets these requirements.

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

Camfil Farr

United State Tel: (973) 616-7300 Fax: (973) 616-7771

Canada Tel: (450) 629-3030 Fax: (450) 662-6035

E-mail: camfilfarr@camfilfarr.com

