

Ideal for pharmaceutical and biotech applications

The Flanders Channel Hood Model-22 is an ideal terminal filter hood for pharmaceutical and biotech cleanrooms, or wherever hoods are regularly validated for performance and leak-free operation. They may be installed in a variety of ceiling types, including tee-bar ceilings, gel-seal grid systems, and plaster ceilings. Ideally suited for ISO Class 5 applications, they may also be used to create ISO Class 7 and 8 areas by locating the appropriate number of units in the ceiling. Units may also be installed for 100% ceiling coverage to achieve cleanliness levels to ISO Class 4.

Gel seal design assures the integrity of the filter seal.

The Channel Hood Model-22 features a gel-seal design offering superior protection against bypass leakage. Invented by Flanders to overcome the leakage problems associated with gasket filter seals, the gel-seal interface assures a positive seal between the replaceable HEPA/ULPA/VLSI filter and the hood. Its effectiveness has been proved in thousands of applications.

Convenient roomside access and service

The Channel Hood Model-22 design allows access to the filters from roomside, without disturbance to the installed housing. Bottom-loading filters make

roomside filter change-out quick and easy. Damper controls and test ports are also easily accessed from roomside by simply removing the protective grille.

Aerosol injection system offers the industry's most uniform challenge for testing installed filters.

The Channel Hood Model-22 aerosol injection system (an option) has become the industry standard for ease of use and reliability in conducting in-place filter testing. Working entirely from roomside, the test technician introduces a challenge aerosol into the hood, then scan-tests the filter. Because it creates a truly uniform test challenge, the Flanders aerosol injection system provides the highest degree of confidence in the results of the scan test.

Available with a wide range of options, including horizontal and reverse flow.

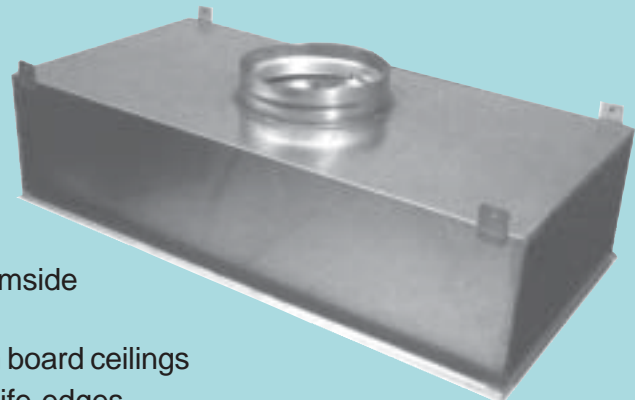
The Flanders Channel Hood Model-22 is easily adapted for horizontal or reverse (exhaust) flow applications.

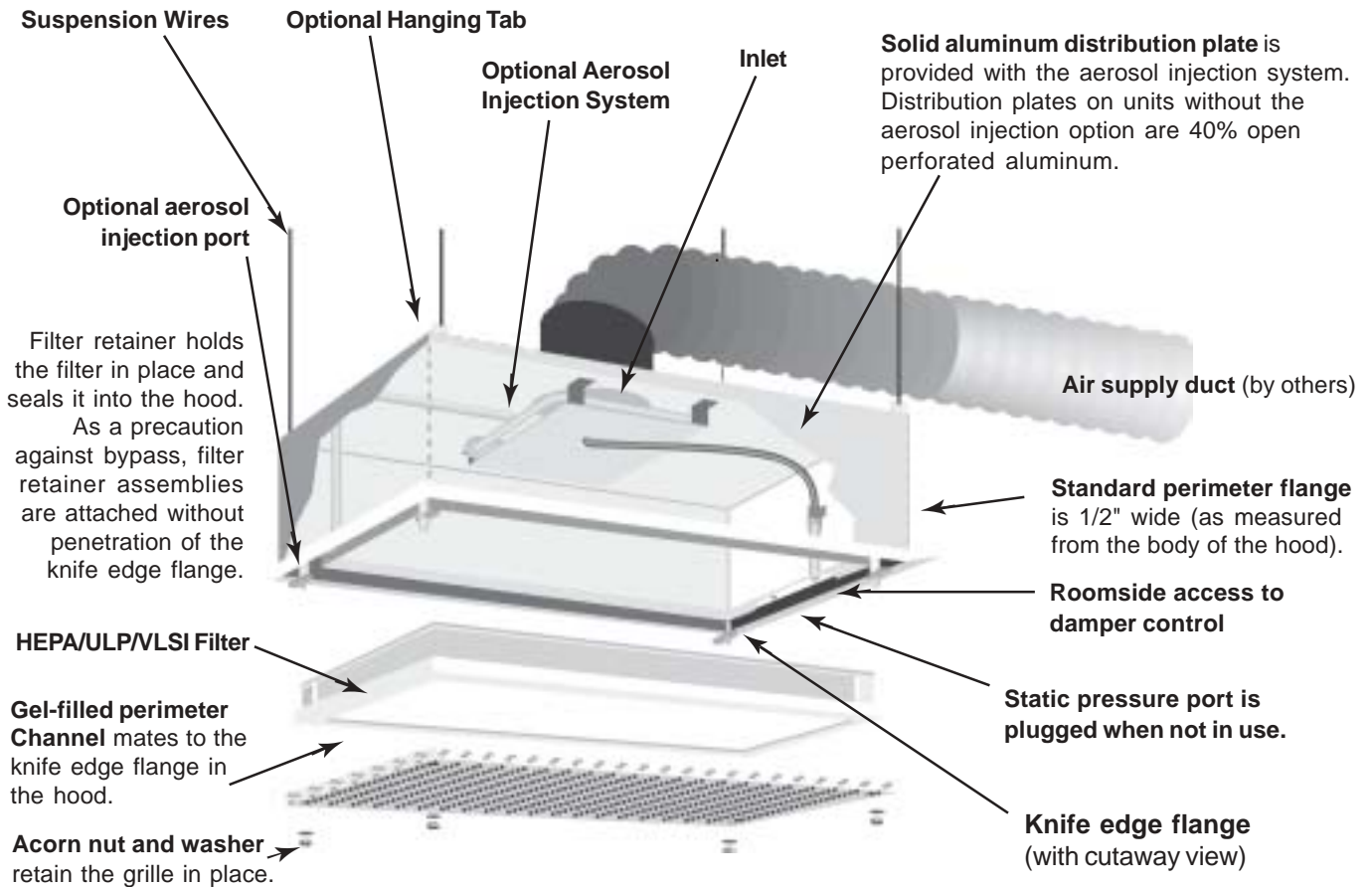
It is available with a wide range of standard options, allowing the unit to be customized to meet the requirements of almost any application.

For special requirements not included in this bulletin, please contact the factory.

Important Features

- All-welded construction
- 100% tested for filter fit at factory
- Filters replaceable from the roomside
- Gel-seal design to prevent bypass leakage
- Heavy-duty butterfly damper adjustable from roomside or optional guillotine
- Aerosol injection system accessible from roomside (optional)
- Designed for installation in tee-bar or gypsum board ceilings
- Filter alignment tabs to center gel track on knife-edges.





Seal welding eliminates leak paths, adds strength.

The body of the Channel Hood Model-22 is continuously welded. This eliminates potential leak paths and produces a one-piece plenum of exceptional strength and durability.

Easy lay-in installation in a standard tee-bar ceiling is facilitated by a perimeter flange around the bottom of the unit. Removable perimeter trim options are available when installing the hood in hard ceilings (See Options.)

Connection to the air supply is made simply by attaching flexible ducting to the top-mounted round 10 inch inlet with butterfly damper. (Other inlet sizes are available as an option.)

Incoming airflow is distributed into the plenum area of the hood by a perforated aluminum distribution plate mounted inside the unit.

Airflow is adjustable from roomside. The standard round butterfly damper is designed and manufactured by Flanders for industrial use. It allows the adjustment of the damper against higher static

pressure than conventional commercial dampers. A standard screwdriver is all that is required to adjust the damper. (Guillotine available upon request)

Grille protects the filter and helps disperse airflow into the clean space. The grille is made of either cold rolled steel (painted white) or 304 stainless steel (optional). Both grilles have a 40% open perforation and can be either flush mounted or extend 2 inches below the body of the hood. The grille is held in place with stainless steel acorn nuts and washers that are threaded on the ends of the filter retainer studs. The grille is easily removable from roomside.

Threaded studs simplify filter maintenance. Filter retainers consist of aluminum tabs that are held captive on threaded studs. The studs are weld-mounted at each end of the unit without penetrating the pressure boundary, thus avoiding a potential leak path. The tabs hold the filter in place and are simply turned 90° to release the filter.

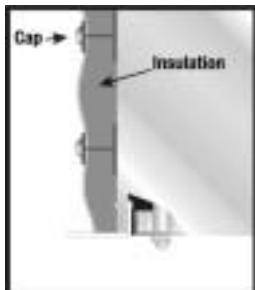
Filter pressure drop can be measured from roomside by taking a reading at the static pressure port. The port also provides a means of sampling the upstream aerosol concentration when scan testing the filter.

Insulation Options

Two-inch-thick fiberglass insulation with aluminum foil backing controls condensation and prevents heat loss. For side-by-side installations in a T-bar ceiling, insulation can be on top only. If units are located individually in the ceiling, insulation can cover top and sides. If a unit with top and side insulation is to be installed in a plaster ceiling, it must also have one of the wider perimeter trim options.

Select option code 1 for insulation on top only.

Select option code 2 for insulation on top and sides.



Inlet Location Options

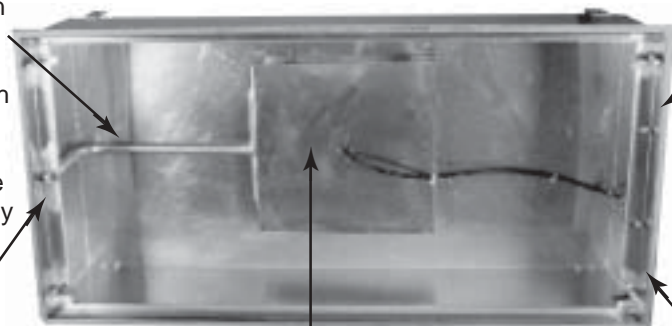
	Option code
Top inlet with butterfly damper:	T1
Top inlet without damper.	T2
Side inlet on short side of hood. Hood Height 18 Inches.	K1
Side inlet on long side of hood. Hood height 18 inches.	K2
Side inlet on short side of hood. No damper. Hood height 18 inches.	K3
Side inlet on long side of hood. No damper. Hood height 18 inches.	K4
Top inlet guillotine damper	TG1

Aerosol Injection System (Option Code J)

Injection tube

A large diameter injection tube allows high concentration of aerosol necessary for testing with log-scale photometer. U-shaped dispersion manifold is located above distribution plate to evenly distribute challenge aerosol.

View from below with filter and grille removed



Aerosol sampling and static pressure port

provides a port for sampling the concentration of the test challenge when scan testing the filter and for measuring the pressure drop across the filter.

Aerosol injection port allows the test aerosol to be injected into the system from roomside.

Solid aluminum distribution plate disperses the airflow and aerosol evenly throughout the plenum area of the hood.

Damper control allows adjustment of the butterfly damper using a standard screwdriver.

Flanders aerosol injection system provides a reliable, proven method of conducting an in-place scan test of the filter in the Channel Hood Model-22

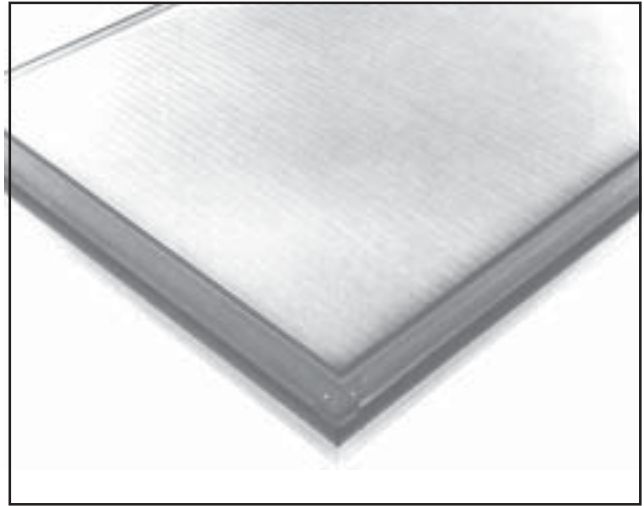
performance of the aerosol injection system is a major factor in the reliability of the filter test. If the aerosol is unevenly concentrated in the plenum, false readings will result.

Working from roomside, the test operator simply removes a plug from the aerosol injection port and introduces the aerosol into the system. By taking a reading at the sampling port, the operator can determine when the test challenge is at the correct concentration. A scan test of the HEPA/ULPA filter can then be conducted from roomside without moving or otherwise disturbing the installed hood. The

For this reason, Flanders submitted the aerosol injection system for independent laboratory testing. The test was conducted in accordance with criteria set forth in ASME N-510 1980 and determined that the injection system achieved a level of dispersion that was uniform within plus or minus 20% of the target concentration. The test report is available upon request.

The Dimple Pleat Advantage

The Channel Hood Model-22 is designed to accept Flanders low-profile, lightweight Dimple Pleat® Filters. This unique filter utilizes a completely separatorless and self-supporting media pack, requiring no glue, string or strips of media to hold adjacent folds of the media apart. Such separator materials are potential sources of off-gassing or particle generation and may not meet the stringent smoke and flame requirements of UL 900 Class 1. They can also block up to 10% of the filter's effective media area. The Dimple Pleat® eliminates these materials as a contamination concern while fully utilizing the filter's media content and providing a clean, streamlined appearance.



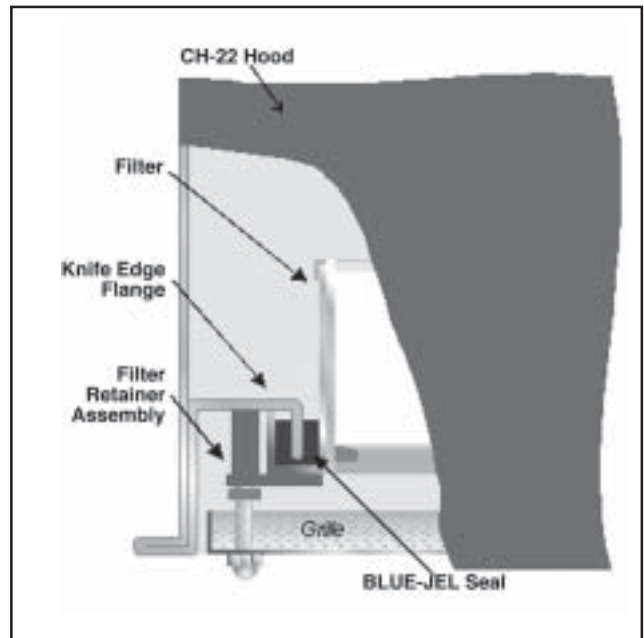
No Strings, Glues or Ribbons

The Dimple Pleat Advantage

Dimple Pleat® filters used in the Channel Hood Model-22 employ Flanders gel-seal technique.

Instead of a gasket, the filter has a perimeter channel filled with Blu-Jel® Seal, a highly self-adhesive, self-healing silicone compound. When the filter is raised into position, a knife-edge flange in the hood mates into the gel channel, effecting a leak-tight interface. A simple retainer on 4 corners is turned 90° to hold the filter in place and the design of the retainer assembly will not allow the knife-edge to bottom out in the gel track of the filter.

Invented by Flanders to eliminate the bypass problems associated with conventional gasketed filters, the gel-seal technique provides superior leak protection for critical cleanroom installations.



Filter Coverage Required to Achieve Various Cleanliness Levels

Clearroom Cleanliness Level	Coverage/Type of Filters Required in Total Ceiling	Number of Air Changes per Hour
ISO-4 (0.12 microns)	100% VLSI© Filters	635
ISO-5 (0.5 microns)	100% HEPA Filters	635
ISO-6 (0.5 microns)	20-60% HEPA Filters	125-380
ISO-7 (0.5 microns)	5-40% HEPA Filters	30-60
ISO-8 (0.5 microns)	5% in Remote Filter Bank	30

Based on a ceiling height of 8.5 feet. Cleanliness levels are also dependent upon variables other than filter coverage, such as airflow velocity, filter distribution, particle generating activity, turbulent areas, and dead spots caused by sprinklers, filler panels, lights and other obstacles. This table is intended as a general guide.

Channel Hood Model-22 Pressure Drop as a Function of Air Velocity

HEPA 99.99% on 0.3 Micron Particles Type C

Air Flow CFM	2x4 (2" Pack)		2x2 (2" Pack)		2x4 (4" Pack)	
	W / Nozzle	No Nozzle	W / Nozzle	No Nozzle	W / Nozzle	No Nozzle
0	0.00	0.00	0.00	0.00	0.00	0.00
200	0.21	0.19	0.51	0.45	0.17	0.14
400	0.49	0.38	1.16	0.90	0.39	0.29
600	0.81	0.57	1.94	1.35	0.68	0.43
800	1.33	0.76			1.14	0.57
1000	1.76	0.95			1.53	0.71

Air Flow CFM	2x2 (4" Pack)		2x2 (6" Pack)		2x2 (6" Pack)	
	W / Nozzle	No Nozzle	W / Nozzle	No Nozzle	W / Nozzle	No Nozzle
0	0.00	0.00	0.00	0.00	0.00	0.00
200	0.40	0.34	0.23	0.20	0.54	0.48
400	0.94	0.68	0.51	0.40	1.22	0.96
600	1.61	1.02	0.85	0.60	2.03	1.43
800			1.38	0.80		
1000			1.83	1.00		

ULPA 99.9995% on 0.12 Micron Particles Type F

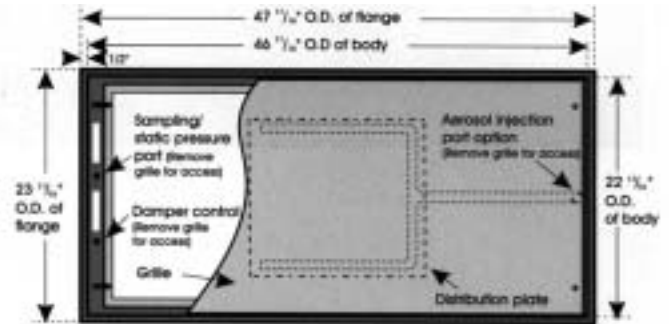
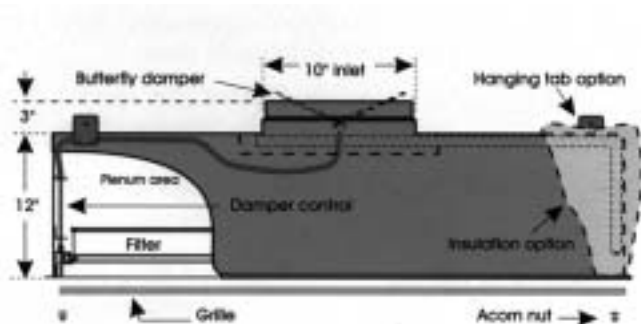
Air Flow CFM	2x4 (2" Pack)		2x2 (2" Pack)		2x4 (4" Pack)	
	W / Nozzle	No Nozzle	W / Nozzle	No Nozzle	W / Nozzle	No Nozzle
0	0.00	0.00	0.00	0.00	0.00	0.00
200	0.27	0.24	0.64	0.58	0.20	0.18
400	0.59	0.49	1.41	1.16	0.46	0.36
600	0.98	0.73	2.32	1.74	0.78	0.54
800	1.54	2.03			1.29	0.71
1000	2.03	1.21			1.71	0.89

Air Flow CFM	2x2 (4" Pack)		2x4 (6" Pack)		2x2 (6" Pack)	
	W / Nozzle	No Nozzle	W / Nozzle	No Nozzle	W / Nozzle	No Nozzle
0	0.00	0.00	0.00	0.00	0.00	0.00
200	0.40	0.34	0.23	0.20	0.54	0.48
400	0.94	0.68	0.51	0.40	1.22	0.96
600	1.61	1.02	0.85	0.60	2.03	1.43
800			1.38	0.80		
1000			1.83	1.00		

* Pressure drops shown are for hoods with filters.

Channel Hood Model-22 Component Chart

CH	E-0781	H	AL22	SF	B1	C2	F	1	J	K1	10
HOUSING: CH HOOD SIZE: E0781- 23-11/16 in. x 47-11/16 in. E0881- 23-11/16 in. x 23-11/16 in. FLOW DIRECTION: V - Vertical Flow H - Horizontal - long side down G - Horizontal - short side down MATERIAL: AL - .063 in. aluminum fabricated SS - 16 guage 304 stainless steel * Note: Other grade of SS available GRILLES: 00 - NONE SF - 22 guage flush stainless steel SE - 22 guage 2 in. extended stainless steel CF - Flush cold rolled steel painted white CE - 2 in. extended, cold rolled steel painted white DD - Downstream diffuser SH - Stainless steel hinged CH - CRS hinged HANGING TABS: 00 - None B1 - Aluminum Hanging B2 - Mounting Pads	INLET: 08 - 8 in. inlet round 10 - 10 in. inlet round 12 - 12 in. inlet round 14 - 14 in. inlet round 08x08 - 8 in. sq. inlet 10x10 - 10 in sq. inlet 12x12 - 12 in. sq. inlet 14x14 - 14 in. sq. inlet INLET LOCATION: T1 - Top with damper T2 - Top no damper K1 - Side inlet - short side K2 - Side inlet - long side K3 - Side inlet - short side - no damper K4 - Side inlet - long side - no damper G1 - Guillotine top AEROSOL: 0 - None J - Aerosol injection system Q - Quick connect aerosol R - Quick disconnect aerosol and static port INSULATION: 0 - None 1 - Top only 2 - Top & sides 3 - Rubatex 1/2" 4 - Armaflex 1/2" FINISH: 0 - None F - Painted white TRIM: 00 - 1/2 in. flange (same material as hood) C2 - 1/2 in. permanent stainless steel C3 - 1/2 in. removable stainless steel C4 - 1-1/2 in. permanent stainless steel C5 - 1-1/2 in. removable stainless steel C6 - Beveled removable trim (not available with permanent trim)										



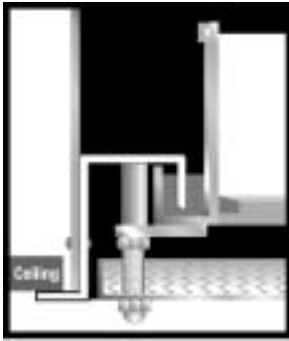


Fig. 1
2" Extended Grille

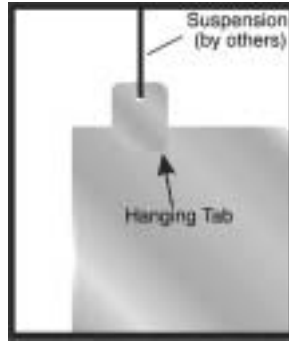


Fig. 2
Hanging tabs are side-mounted near each corner of the hood.

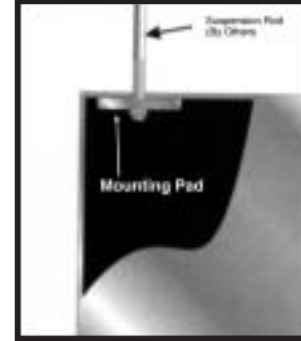


Fig. 3
Mounting pads (one at each upper corner) are located inside the hood.

The following options can be specified by including the appropriate underlined option codes in the Channel Hood Model-22 style code from the component chart.

Construction Options

Aluminum construction shall be from .063" Aluminum. Select **Option Code AL** for .063 inch thickness aluminum.

Stainless steel construction from mill finish, 16 gauge Type 304. Select **Option Code SS** for 16 ga. type 304 mill finish stainless steel. (Hood only. Some parts are not stainless steel)

Grille Options

Flush mounted grilles with 40% open perforation. Elect **Option Code CF** for cold rolled steel, painted white. Select **Option Code SF** for Type 304 stainless steel. **Option Code SH** for stainless steel hinged or **Option CH** for hinged CRS.

2 inch extended grilles extend 2 inches below the hood for better airflow diffusion into the room. Select **Option Code CE** for cold rolled steel, painted white. Select **Option Code SE** for Type 304 stainless steel.

Downstream 4-way diffusers (not shown) provide the maximum "throw" of air into a room space. Select option code DD for this feature.

Support Options

Aluminum hanging tabs or mounting pads allow the hood to be suspended from overhead.

Select **Option Code B1** for hanging tabs. See Fig. 2. Select **Option Code B2** for mounting pads. See Fig. 3.

Trim Options

A permanent perimeter trim and knife-edge made with aluminum or type 304 stainless steel provides an attractive, finished appearance. (See Fig. 4.)

Select **Option Code 00** for integral 1/2 inch wide aluminum or stainless steel permanent trim. (Dependent on hood construction) See Fig. 4

Select **Option Code C2** for standard 1/2 inch wide stainless steel permanent trim. See Fig. 5

Select **Option Code C4** for 1-1/2 inch wide stainless steel permanent trim. This is the mandatory choice for unit with insulation on top and sides for installation into plaster ceilings. See Fig. 5

A removable perimeter trim made of Type 304 stainless steel can be provided as a plaster ring for hoods that are flush mounted in hard ceilings. The trim is attached after the unit is installed in the ceiling and provides an attractive finished appearance.

Select **Option Code C3** for standard 1/2 inch wide removable trim. See Fig. 6

Select **Option Code C5** for 1-1/2 inch wide removable trim. This is the mandatory choice for units with insulation on top and sides for installation into plaster ceilings. See Fig. 6

Finish Options

Select **Option Code 0** for non-painted finish.

Select **Option Code F** for a white powder painted finish inside and out.

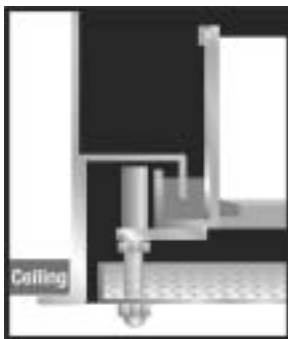


Fig. 4
Aluminum
Permanent Perimeter Trim/Knife Edge

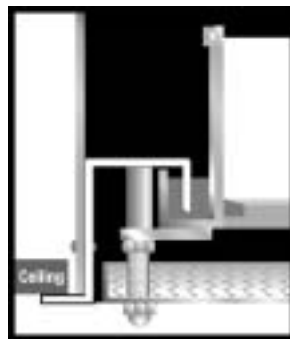


Fig. 5
Stainless Steel
Permanent Perimeter Trim/Knife edge

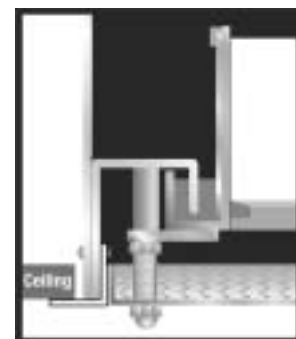


Fig. 6
Stainless Steel
Removable Perimeter Trim

Guide Specifications

- 1.0 General
- 1.1 Ducted Supply Hood shall be Channel Hood Model-22 as manufactured by Flanders/CSC for Flanders Filters.
- 1.2 Hood sizes, efficiencies, capacities and construction options shall be as scheduled or noted on the drawings.
- 2.0 Hood construction
- 2.1 The hood shall be constructed of .063 in. Aluminum or 16 gauge Type 304 stainless steel with all straight seams of the module continuously welded. All other joints and the seams shall be intermittently welded and/or sealed with RTV sealant.
- 2.2 Select one of the following:
 - 2.2.1 The hood shall be sized for lay-in installation into a 1-1/2 inch gasketed Tee Grid system having 24 inch x 48 inch and 24 inch x 24 inch grid dimensions. The perimeter flange and knife-edge shall be constructed of the same material as the hood.
 - 2.2.2 The hood shall be designed for lay-in installation into a 1-1/2 inch gasketed Tee Grid System having 24 inch x 48 inch and/or 24 inch x 24 inch grid dimensions. The perimeter flange and knife-edge shall be constructed of Type 304 stainless steel and shall be riveted and sealed into the hood.
 - 2.2.3 The hood shall be designed for flush installation into a hard ceiling. A separate stainless steel 1/2 inch or 1-1/2 inch wide perimeter flange shall be provided and after the hoods are installed in the ceiling, the perimeter flange shall be provided and after the hoods are installed in the ceiling, the perimeter flange shall be riveted and sealed to the hood to provide a clean appearance.
- 2.3 Select one of the following:
 - 2.3.1 The hood shall have a top or side mounted 8 inch, 10 inch, 12 inch or 14 inch round inlet with a butterfly damper adjustable from roomside by means of a screwdriver inserted into a slot to turn a rotary flexible shaft mechanism. The closed damper shall be capable of being opened against 3 inch w.g. static pressure.
 - 2.3.2 The hood shall have a top or side mounted 8 inch x 8 inch, 10 inch x 10 inch, 12 inch x 12 inch, or 14 inch x 14 inch square inlet with a quarter turn opposed blade damper adjustable from roomside by means of a screwdriver inserted into a slot to turn a rotary flexible shaft mechanism.
- 2.4 A perforated distribution plate shall be mounted beneath the inlet to diffuse air evenly into the plenum.
- 2.5 A 40% open perforated grille fabricated of 22 gauge cold-rolled steel and painted white or type 304 stainless steel shall be flush mounted, extend 2 in. below the perimeter flange of the hood. The grille shall be easily removed from roomside by removing four (4) acorn nuts and washers.
- 2.6 The hood shall have a static pressure port for measuring resistance across the filter top or the top and sides and for measuring the upstream aerosol concentration when leak testing. The static pressure port shall not be located in the filter.
- 2.7 The filter shall be sealed in the hood by a gel-seal. The filter shall have a perimeter channel filled with Flanders Blu-Jel® silicone sealant. When the filter is positioned in the hood, the knife-edge in the hood shall penetrate the gel and form a leaktight seal. The filter is held in place with four (4) retainers that are turned 90° the knife-edge shall not bottom out in the gel track of the filter.
- 2.8 The hood shall be provided with 2 inch thick foil back insulation on either the top and sides of the module. The insulation shall be tested in accordance with ASTM-E84 and UL 723 to meet a rating of 25-flame spread, 50 fuel contained and 50 smoke developed.
- 2.9 The hood shall be suspended by 2 inch x 2 inch x .063 inch aluminum hanging tabs with 5/16 inch holes or by 2 inch x 2 inch x 1/8 inch aluminum mounting pads with 7/16 inch diameter holes mounted on the top corners of the module.
- 2.10 The hood shall be equipped with an aerosol dispersion nozzle to inject a challenge aerosol upstream of the filter when testing the filters for leaks. The inlet connection shall be a plug with a 1/2-inch full coupling located in the knife edge of the module and not in the filter. The challenge aerosol shall be released through an aerosol dispersion apparatus located upstream of a solid distribution plate.

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