



**TAD Series**  
This series of radial face, critical room supply diffusers offer 90° or 180° air patterns. Available in aluminum or stainless steel construction. A HEPA filter backpan model is also available.



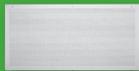
**Radiaflo™ Series**  
This series of flush face, radial critical room supply diffusers offer a 180° air pattern. Available in aluminum or stainless steel construction. A HEPA filter backpan model is also available.



**Steriflo System®**  
Steriflo System® is a stainless steel operating room system consisting of center and perimeter panels yielding exceptional particulate control.



**Steriflex™**  
Steriflex™ is a modular, aluminum operating room system consisting of center and perimeter panels yielding exceptional particulate control.



**5000, 5000HF**  
The 5000 series are low velocity, non-aspirating, perforated laminar flow panels with aluminum, stainless steel, and cold rolled steel construction. A HEPA filter backpan model is also available.



**CRFF Series**  
The CRFF series of critical room fan filter units feature PSC or ECM motors and multiple filter options.

**TAD, TADSS, TADHF, TADSSHF, TAD Backpan**

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## Introduction: 5000, 5000HF

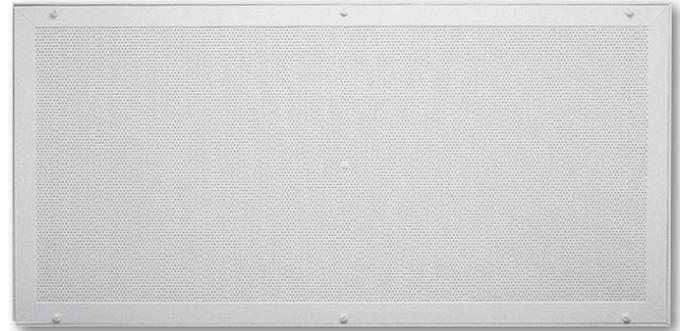
The Krueger 5000 series is a low velocity, non-aspirating, perforated distribution panel, which is ideal for use in restricted budget surgery areas, pharmaceutical manufacturing, industrial, electronic, aerospace, and other clean room applications.

The Krueger 5000 series is available in two frame styles: Frame 22 for surface mounting and Frame 23 for T-Bar applications. The variation in material options allows the designer a degree of flexibility never before available in perforated panel systems. Further, Krueger's 5000 is available in a large range of panel sizes. The various panel sizes allow for flexibility when incorporating panels into a ceiling layout containing other components, such as lighting, gas outlets, etc. This is especially desirable in the case where a clean work area is desired rather than an entire clean room.

The Krueger 5000 series has alleviated many of the problems encountered with perforated panel distribution. Issues that have been alleviated include the mass flow effect of cold air as well as problems distributing the air equally across the perforated face of the diffuser. Krueger engineering has helped resolve these issues by designing the Krueger 5000 with larger inlets and with multiple inlets on larger size panels avoiding the problem of unequal air distribution across the face of the panel.

When designing rooms using the Krueger 5000 series, it is advisable to group the panels as closely together as possible creating a solid mass of clean air delivered to the desired space. Wide separation of the panels creates conflicting airstreams from the separate groupings, which in turn creates turbulence and contamination problems.

While the Krueger 5000 panels have been used in hospital operating rooms and industrial clean rooms since 1960, we recommend that consideration be given to Krueger's Sterilflo System® for major operating rooms where conditions are critical. The Sterilflo System® has documented air cleanliness capabilities, both microbiological and particulate, and is installed in thousands of operating rooms throughout the world.



5000

### MODEL

- 5000 - Laminar Flow Panel; Aluminum, Stainless Steel, and Cold Rolled Steel Construction
- 5000HF - Laminar Flow Panel with Gel Seal HEPA Filter Brackets, Aluminum and Stainless Steel Construction
- 5FILTER - HEPA Filter for 5000HF

### 5000 FEATURES

- Low velocity, non-aspirating.
- Quick opening (1/4 turn) fasteners permit complete removal of the face.
- Optional volume dampers available.
- Optional integral T5 lights available.
- Safety cables (2) prevent accidental dropping of face.
- Multiple perforated face panels included for large sizes.
- Button plug on perforated face is removable for adjustment of neck mounted damper.
- Standard finish depends on ordered options.
- Frame Styles: Surface mount (F22) and lay-in T-bar (F23).

### 5000HF FEATURES

- Low velocity, non-aspirating.
- Quick opening (1/4 turn) fasteners permit complete removal of the face.
- Fast, easy room-side HEPA filter removal.
- Optional integral T5 lights available.
- Safety cables (2) prevent accidental dropping of face.
- Available panel sizes are only 24"x24", 24"x36", and 24"x48".
- Frame Styles: Surface mount (F22) and lay-in T-bar (F23).

**Vertical Flow Acceleration of Cold Air Masses**

Laboratory tests of the 5000 series perforated distribution panels provide the designer of clean rooms with some valuable information.

Due to the low percentage of perforated area in comparison with the overall area of the laminar panel, there is a tendency for air to be discharged vertically downward from the diffuser and pull inward or coalesce into a smaller, tighter air pattern. At some distance below the diffuser, the air pattern coverage is a little less than the dimensions of the diffuser. The effect is increased when cold air is discharged.

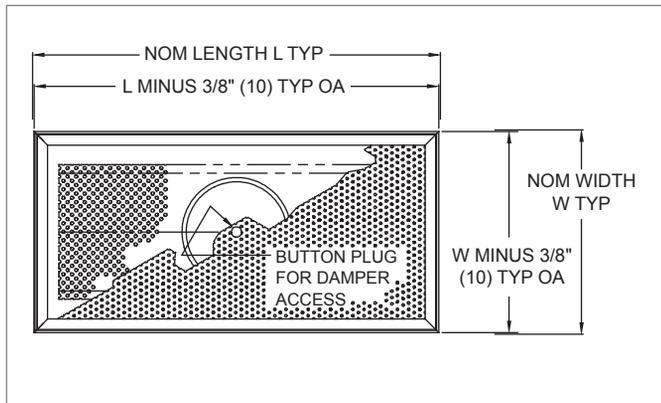
The buoyancy of air is effected by temperature. When the entering air temperature is decreased, this increases the effect of cold air negative buoyancy. The surrounding warm air increases the coalescing effect, which results in an

increased velocity of the cold airstream as the cold air mass moves downward. The velocity of cold air from a single panel of 15 ft<sup>2</sup> or less reaches a minimum area of coverage and a maximum velocity at a distance of approximately 4' to 8' below the diffuser, depending on diffuser size and amount of cooling of the air stream. Beyond this distance, velocities begin to reduce and air patterns begin to spread.

When multiple 5000 panels are grouped together, effectively producing a larger square footage of diffusing area, the resultant point of minimum area coverage and maximum velocity is at a much greater distance from the ceiling than a single diffuser. The airstream may continue to accelerate and coalesce until it hits the floor of the room, producing higher velocities at a distance of 6' below the diffuser area. This increased velocity effect is shown in the performance data.

**5000 Dimensional Information**

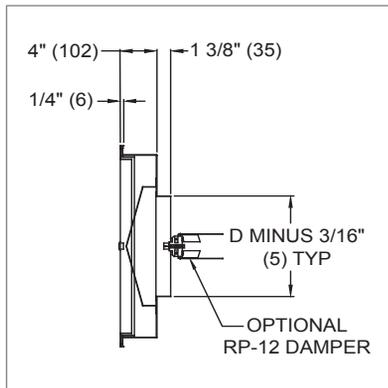
**5000, FACE VIEW**



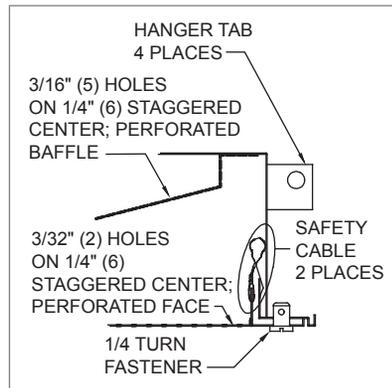
**5000, AVAILABLE SIZES**

Nominal Unit Size		Nominal Inlet Size	
W	L	D	Quantity
12" (305)	48" (1219)	6" (152) or 8" (203)	1
	60" (1524)		1
	72" (1828)		2
24" (610)	24" (610)	6" (152), 8" (203), 10" (254), or 12" (305)	1
	36" (914)		1
	48" (1219)	8" (203), 10" (254), or 12" (305)	1
	60" (1524)		1
	72" (1828)		2
36" (914)	48" (1219)	8" (203), 10" (254), or 12" (305)	1
	60" (1524)		2
	72" (1828)		2

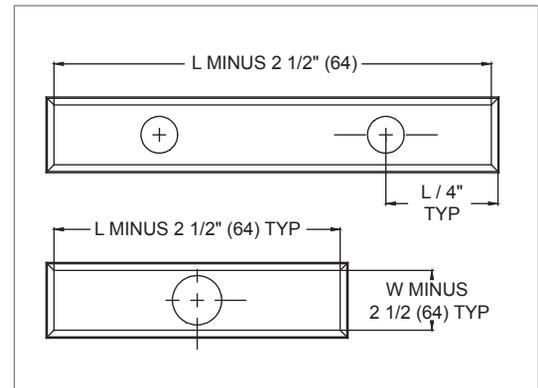
**5000, CROSS SECTION**



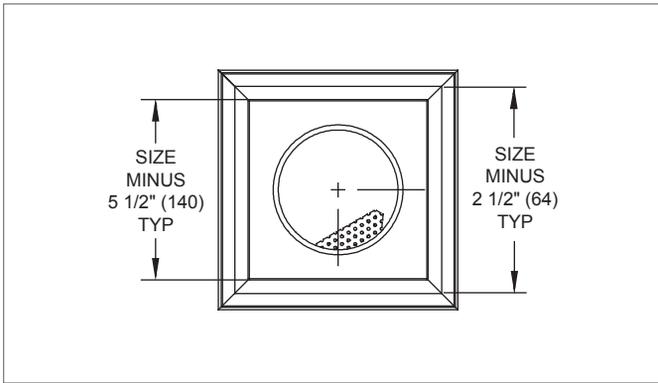
**5000, CONSTRUCTION DETAIL**



**5000, INLET LOCATIONS**

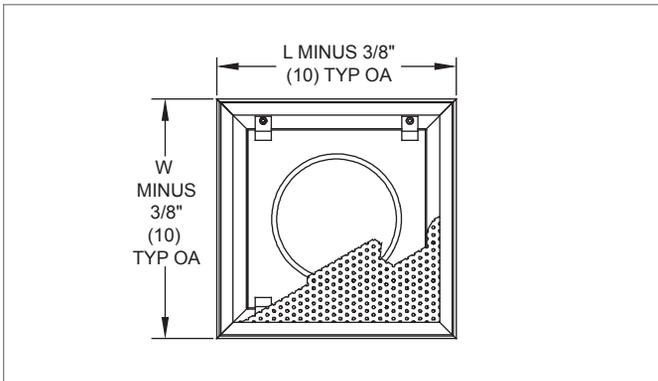
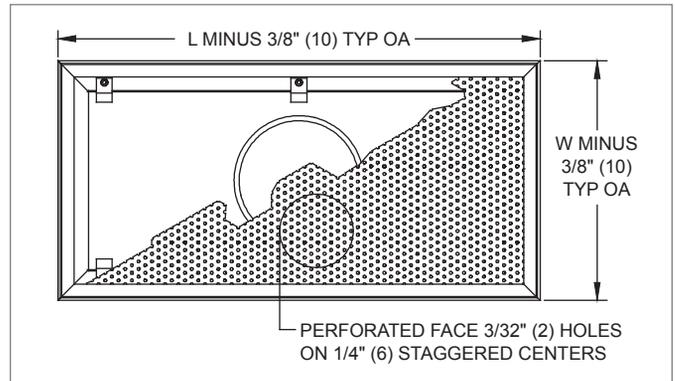
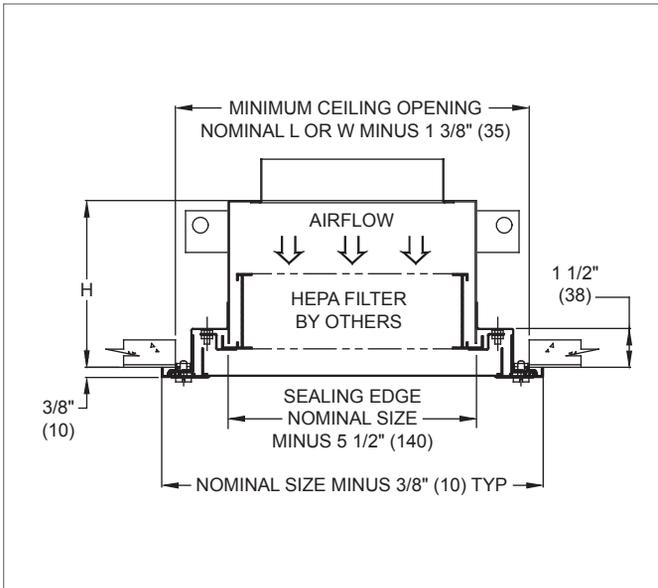
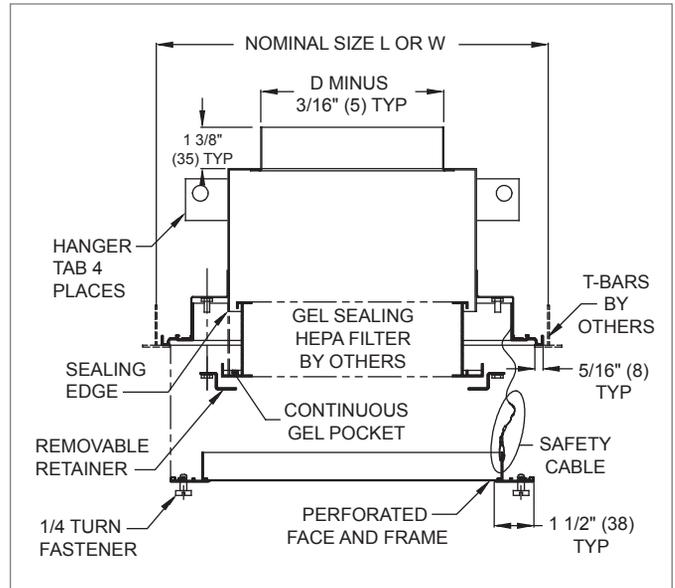


NOTE: Dimensions in parentheses are mm.

**5000HF Dimensional Information**
**5000HF, TOP VIEW, ALL PANELS**

**5000HF, AVAILABLE SIZES**

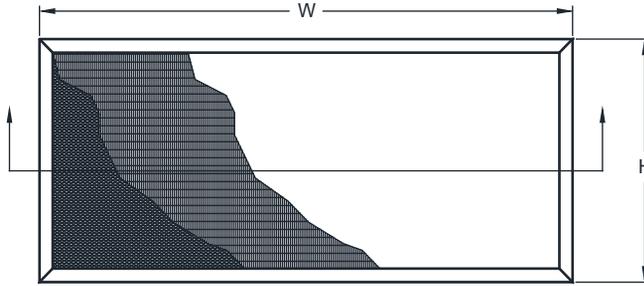
Nominal Unit Size		Nominal Inlet Size	
L	W	D	H
24" (610)	24" (610)	8" (203)	7" (178)
		10" (254)	7 3/4" (197)
36" (914)	24" (610)	8" (203)	7 3/8" (187)
		10" (254)	8 1/8" (206)
		12" (305)	8 7/8" (225)
48" (1219)	24" (610)	10" (254)	7 3/4" (197)
		12" (305)	8 1/2" (216)

NOTE: Dimensions in parentheses are mm.

**5000HF, FACE VIEW, 24"x24" PANEL**

**5000HF, FACE VIEW, 48"x24" PANEL**

**5000HF, ASSEMBLED CROSS SECTION, FRAME 22, SURFACE MOUNT SHOWN**

**5000HF, EXPLODED CROSS SECTION, FRAME 23, LAY-IN T-BAR SHOWN**


**5FILTER Dimensional Information**

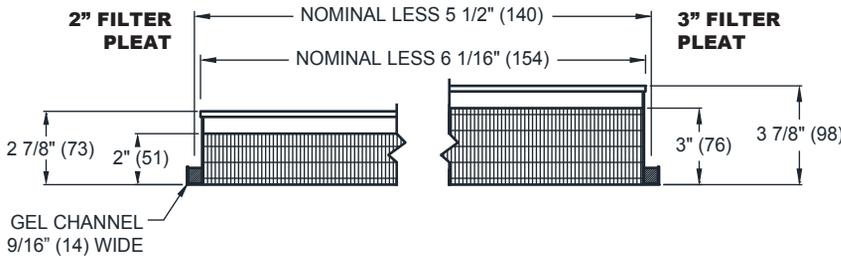
**5FILTER, 24"x24", 24"x36", & 24"x48" PANEL FACE AND SIDE VIEWS**



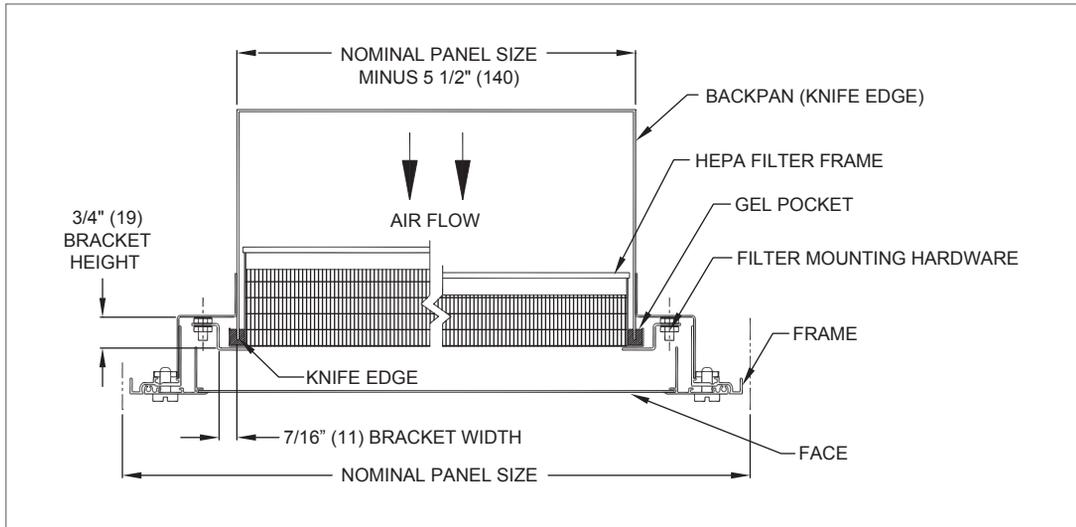
PANEL SIZE	W	H
24"x24" (610x610)	19 1/16" (484)	19 1/16" (484)
24"x36" (610x915)	19 1/16" (484)	31 1/16" (789)
24"x48" (610x1220)	19 1/16" (484)	43 1/16" (1094)

**STANDARD FEATURES:**

1. HEPA Type J.
2. 99.99% Minimum Efficiency.
3. Each filter is tested and certified.
4. Anodized extruded aluminum frame.
5. Lightweight and compact.
6. Gel pocket provides airtight seal around edges.
7. Mini-pleat design features maximum media cleaning potential.
8. Classified under UL 900.
9. Custom Sizes:  
Filter dimensions equal to nominal minus 4 15/16" for length and width (i.e. 24"x36" = 19 1/16" x 31 1/16").



**5FILTER, INSTALLATION VIEW**



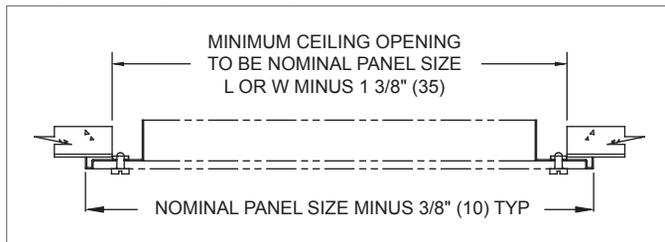
NOTES: Dimensions in parentheses are mm.

CRITICAL ROOM PRODUCTS

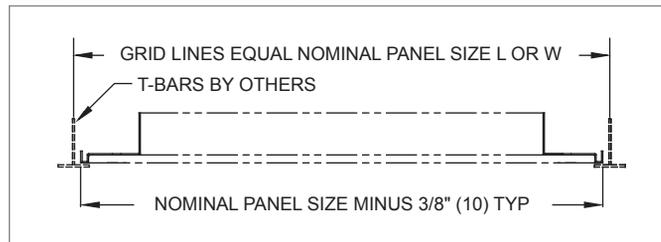
5000

**5000, 5000HF Installation Details**

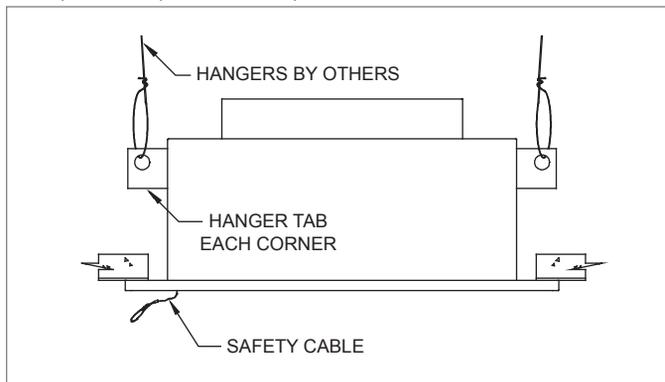
**5000, 5000HF, FRAME 22, SURFACE MOUNT: STEP 1**



**5000, 5000HF, FRAME 23, LAY-IN T-BAR: STEP 1**

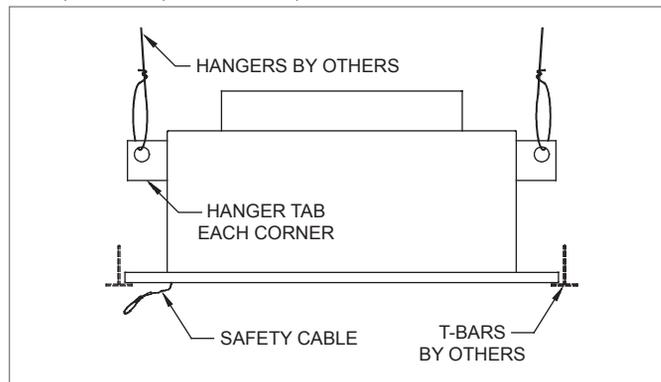


**5000, 5000HF, FRAME 22, SURFACE MOUNT: STEP 2**



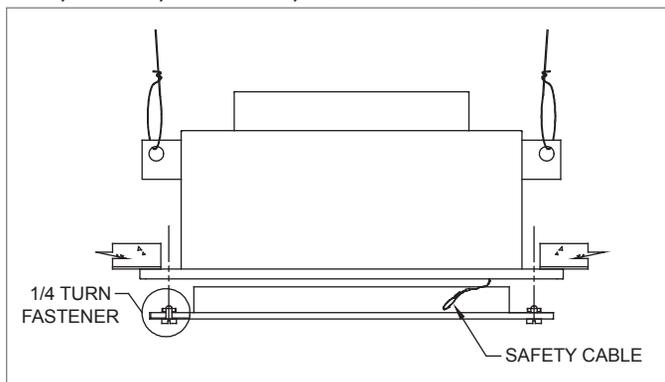
*NOTE: Locate 5000/5000HF backpan assembly against ceiling, bend out hanger tabs at each corner, and attach to structural support above.*

**5000, 5000HF, FRAME 23, LAY-IN T-BAR: STEP 2**



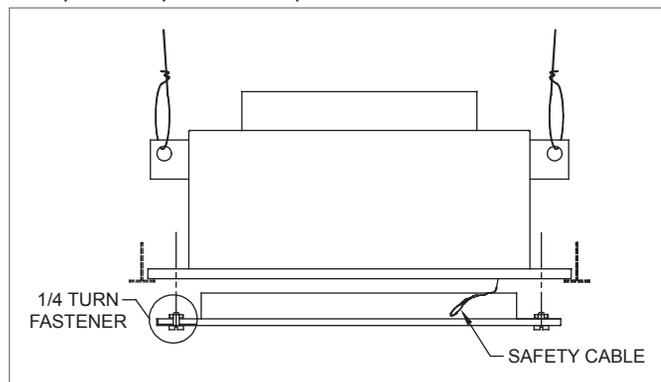
*NOTE: Locate 5000/5000HF backpan assembly in T-bar grid, bend out hanger tabs at each corner, and attach to structural support above.*

**5000, 5000HF, FRAME 22, SURFACE MOUNT: STEP 3**



*NOTES: Attach 5000/5000HF unit face to backpan safety cables. Install face with captive quarter turn fasteners.*

**5000, 5000HF, FRAME 23, LAY-IN T-BAR: STEP 3**



*NOTES: Attach 5000/5000HF unit face to backpan safety cables. Install face with captive quarter turn fasteners.*

*NOTES: Dimensions in parentheses are mm. See pages B3-47 and B3-48 for dimension references.*

CRITICAL ROOM PRODUCTS

5000

**5000, 5000HF Performance Data**

IP/METRIC DATA: 5000, 5000HF

	IP Data							NC	Metric Data					
	Flow Rate	Ps	Velocity @ 6' Below Panel				Flow Rate		Ps	Velocity @ 1.8m Below Panel				
			5° FΔT	10° FΔT	15° FΔT	20° FΔT				3° CΔT	6° CΔT	8° CΔT	11° CΔT	
	CFM/ft²	"WG	FPM	FPM	FPM	FPM	L/s/m²		Pa	m/s	m/s	m/s	m/s	
Single Panel	10	0.008	20	25	30	35	<20	51	2.0	0.10	0.13	0.15	0.18	
	20	0.032	35	40	45	55	<20	101	8.0	0.18	0.20	0.23	0.28	
	30	0.072	50	60	70	80	21	152	17.9	0.25	0.30	0.36	0.41	
	40	0.128	65	80	95	105	25	203	31.9	0.33	0.41	0.48	0.53	
15-30 ft² (1.5-3.0m²)	10	0.008	20	30	30	35	<20	51	2.0	0.10	0.15	0.15	0.18	
	20	0.032	35	45	50	60	22	101	8.0	0.18	0.23	0.25	0.30	
	30	0.072	50	65	80	90	26	152	17.9	0.25	0.33	0.41	0.46	
	40	0.128	70	90	105	-	30	203	31.9	0.36	0.46	0.53	-	
Over 30 ft² (<3m²)	10	0.008	25	30	35	40	21	51	2.0	0.13	0.15	0.18	0.20	
	20	0.032	40	50	60	65	25	101	8.0	0.20	0.25	0.30	0.33	
	30	0.072	60	75	90	100	29	152	17.9	0.30	0.38	0.46	0.51	
	40	0.128	80	100	-	-	33	203	31.9	0.41	0.51	-	-	

NOTES: Data is based on a 24" x 48" 5000 with 12" inlet and full, open damper.

NC is based on a 10dB room attenuation sound power re 10<sup>-12</sup> Watts. Multiple panels will add to the sound level as follows:

**NC CORRECTION CHART**

ft² of Panels	4	8	16	24	32	40	48	64	> 64
m² of Panels	0.4	0.7	1.5	2.2	3.0	3.7	4.5	6.0	> 6
NC Correction	-3	0	3	5	6	7	8	9	10

**5000 AVAILABLE PANEL SIZES**

Panel ft²	Panel Size
4	1' x 4'
4	2' x 2'
5	1' x 5'
6	1' x 6'
6	2' x 3'
8	2' x 4'
10	2' x 5'
10	2' x 6'
12	3' x 4'
15	3' x 5'
18	3' x 6'

**5000HF AVAILABLE PANEL SIZES**

Panel ft²	Panel Size
4	2' x 2'
6	2' x 3'
8	2' x 4'

CRITICAL ROOM PRODUCTS

## 5000, 5000HF Design Guide Example 1

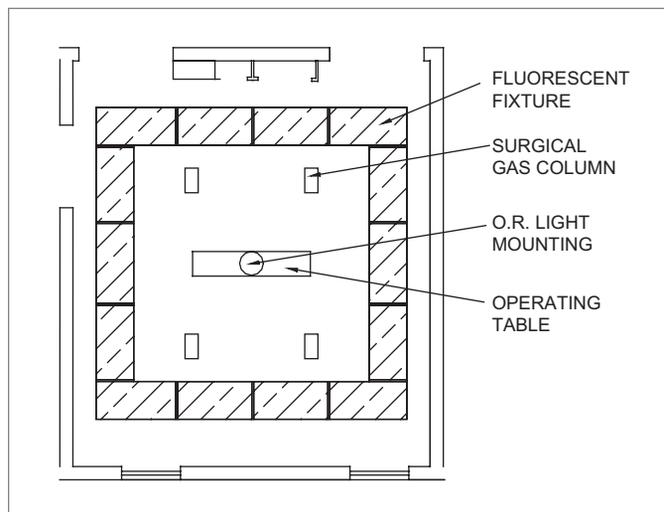
### PROBLEM 1:

Hospital Minor Surgery or Exam Room (Cysto, Procto, X-Ray, etc.) 20'x20' with 9' 6" Ceiling Height

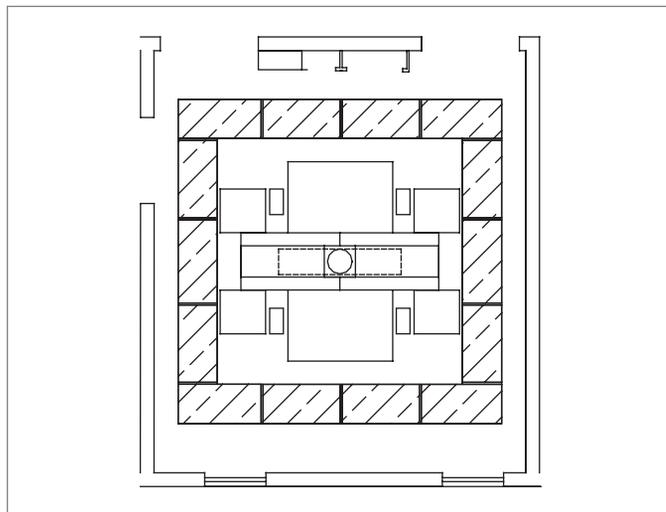
### ASSUMED DESIGN CONDITIONS:

- 25 Air Changes per Hour
- 50 FPM Velocity Over Operating Table (3' 6" From Floor)
- 10°F Cooling  $\Delta T$  to Handle Heat Load when Room is in Use

### ORIGINAL CEILING LAYOUT



### SUGGESTED 5000 CEILING LAYOUT



### SOLUTION:

$$\text{Room Volume} = \text{Length} \times \text{Width} \times \text{Height} = 20' \times 20' \times 9.5' = 3800 \text{ ft}^3$$

CFM required for 25 air changes:

$$\frac{25 \text{ Air Changes/hr} \times \text{Room Volume (ft}^3\text{)}}{60 \text{ min/hr}} = \frac{25 \times 3800}{60} = 1583 \text{ cfm}$$

Based on the calculated CFM (1583 cfm), a single panel will not be sufficient for this volume, so multiple panels will be used for our calculations.

From the performance data with 10°F cooling  $\Delta T$ , locate the desire velocity (50 fpm) at 6' below ceiling (3' 6" from floor). Referring to multiple panels between 15 and 30 ft<sup>2</sup>, this is between 20 and 30 cfm/ft<sup>2</sup>.

Using table at right for interpolation, solve for F.

$$F = A - \frac{(C - E) \times (A - B)}{(C - D)} = 20 \text{ cfm/ft}^2 - \frac{(45 - 50) \times (20 - 30) \text{ cfm/ft}^2}{(45 - 65) \text{ fpm}} = 22.5 \text{ cfm/ft}^2$$

CFM/ft <sup>2</sup>	FPM
A = 20	C = 45
F = ?	E = 50 (Desired Velocity)
B = 30	D = 65

Dividing the total room CFM by 22.5 gives us 70.4 ft<sup>2</sup> of panel required. This value is over 30 ft<sup>2</sup>, so using the performance data for 10°F cooling  $\Delta T$  and over 30 ft<sup>2</sup> of panel at the desired velocity of 50 fpm, the result is 20 cfm/ft<sup>2</sup> of panel.

Now we have established 20 cfm/ft<sup>2</sup> of panel, divide the total CFM by 20 cfm/ft<sup>2</sup> of panel to obtain the square feet required.

$$\frac{1583 \text{ cfm/ft}^2 \text{ of Panel}}{20 \text{ cfm}} = 79 \text{ ft}^2$$

**5000, 5000HF Design Guide Example 1 (Continued)**

From the Available Panel Sizes chart on the performance data, determine the minimum number of standard 5000 panels which will total the desired square footage (79 ft<sup>2</sup>), which can be incorporated into the ceiling with little or no relocation of other ceiling mounted equipment such as surgical lighting, gas columns, etc. See Original Ceiling Layout on previous page. The panels should be grouped in one mass if possible and located directly over and adjacent to the operating table. To accomplish this objective use (see Suggested 5000 Ceiling Layout on previous page) (2) 2'x4' panels, located over the operating table with space between them for the OR light. (4) 1'x5' panels are located with two on each side (1) 3'x5' panel and (2) 2'x2' panels are then located next to the 1'x5' panels and adjacent to the surgical gas columns. This gives us a total square footage as follows.

(2) 2' x 4' panels =	16 ft <sup>2</sup>
(2) 3' x 5' panels =	30 ft <sup>2</sup>
(4) 1' x 5' panels =	20 ft <sup>2</sup>
(4) 2' x 2' panels =	16 ft <sup>2</sup>
	82 ft <sup>2</sup> Total

**CHECK VELOCITY:**

$$\frac{\text{Total Room CFM}}{\text{ft}^2 \text{ of panel}} = \frac{1583}{82} = 19.3 \text{ cfm/ft}^2$$

This is within 5% of the original goal of 20 cfm/ft<sup>2</sup> and will produce 50 fpm at table height within measurable limits.

From the performance data, determine the required static pressure and NC.

- Static Pressure Drop at 20 cfm/ft<sup>2</sup> = .032 "WG
- NC Level for over 30 ft<sup>2</sup> of Panel at 20 cfm/ft<sup>2</sup> = 25
- NC Correction for (82 - 30 ft<sup>2</sup>) 52 ft<sup>2</sup> of Panel = +8
- Maximum NC Total = (25 + 8 NC) 33 NC

**5000, 5000HF Design Guide Example 2**

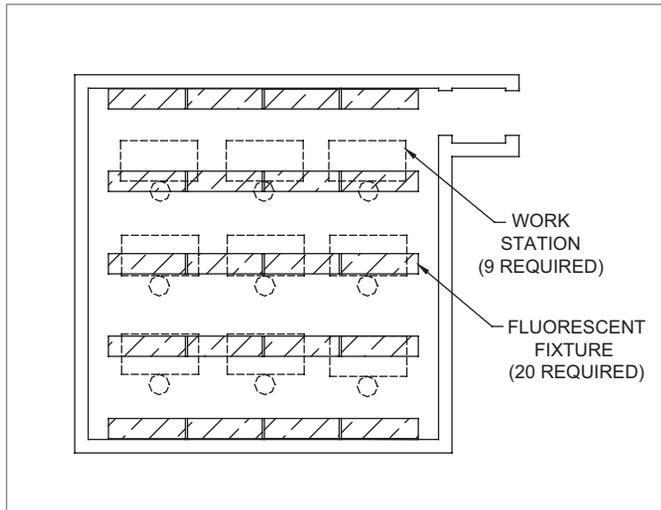
**PROBLEM:**

Clean Room (Electronics, Industrial, Aerospace, Photographic) 18'x18' with 9' Ceiling Height, 9 Work Stations. See Original Ceiling Layout below.

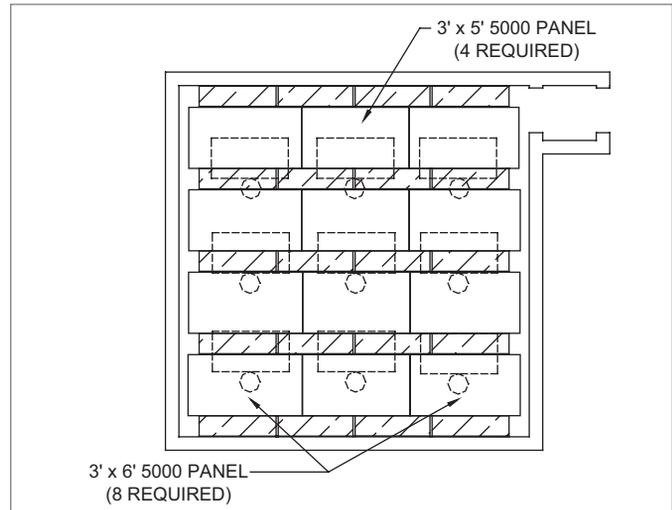
**ASSUMED DESIGN CONDITIONS:**

- 100 Air Changes per Hour
- 50 FPM Velocity Over Work Stations (3' From Floor)
- 5°F Cooling ΔT to Handle Heat Load when Room is in Use

**ORIGINAL CEILING LAYOUT**



**SUGGESTED 5000 CEILING LAYOUT**



CRITICAL ROOM PRODUCTS

5000

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## 5000, 5000HF Design Guide Example 2 (Continued)

### SOLUTION:

$$\text{Room Volume} = \text{Length} \times \text{Width} \times \text{Height} = 18' \times 18' \times 9' = 2916 \text{ ft}^3$$

CFM required for 100 air changes:

$$\frac{100 \text{ Air Changes/hr} \times \text{Room Volume (ft}^3\text{)}}{60 \text{ min/hr}} = \frac{100 \text{ Air Changes} \times 2916 \text{ ft}^3}{60 \text{ min/hr}} = 4860 \text{ cfm}$$

From the performance data, at 5°F cooling  $\Delta T$ , locate the desired velocity at 3' from the floor (6' below ceiling). Due to the high CFM requirement for the room, it is obvious that more than 30 ft<sup>2</sup> of adjacent panels will be required. For over 30 ft<sup>2</sup> of adjacent panels with 5°F cooling  $\Delta T$ , 50 fpm velocity will require between 20 and 30 cfm/ft<sup>2</sup> of panel.

Interpolation indicates 25 cfm/ft<sup>2</sup>. With a total of 4860 cfm at 25 cfm/ft<sup>2</sup>, a total 4860/25 or 194.4 ft<sup>2</sup> of panels are required. Due to the restrictions imposed by the lighting layout and the room size, a choice was made to use four rows of panels with each row containing (1) 3'x5' panel and (2) 3'x6' panels, giving a total square footage as follows. See Suggested 5000 Ceiling Layout on previous page.

$$\begin{aligned} (1) 3' \times 5' &= 15 \text{ ft}^2 \\ (2) 3' \times 6' &= 36 \text{ ft}^2 \text{ (or 51 ft}^2 \text{ per row)} \\ (4 \text{ Rows}) &= 51 \text{ ft}^2 \times 4 = 204 \text{ ft}^2 \end{aligned}$$

### CHECK VELOCITY:

$$\frac{\text{Total Room CFM}}{\text{ft}^2 \text{ of panel}} = \frac{4860}{204} = \frac{23.82 \text{ cfm}}{\text{ft}^2}$$

This satisfies the design requirements. From the performance table, determine the required static pressure and NC.

- Static Pressure Drop at 25 cfm/ft<sup>2</sup> = .050 "WG
- NC Level for over 30 ft<sup>2</sup> of Panel at 25 cfm/ft<sup>2</sup> = 27
- NC Correction for (204 - 30 ft<sup>2</sup>) 174 ft<sup>2</sup> of Panel = +10
- Maximum NC Total = (27 + 10 NC) 37 NC

**5000 Suggested Specification & Configuration**

**5000**

The non-aspirating, laminar flow diffuser shall be a Krueger model 5000.

The diffuser backpan shall have a hanger tab at all four corners to permit its attachment to the overhead structure.

The face of the diffuser shall be completely removable for sanitizing. The face shall be secured with quick turn fasteners and shall have safety cables to prevent its accidental removal.

The face of the diffuser shall have a free area not exceeding 15% to ensure true non-aspirating flow.

The diffuser shall be available in electrocoated baked paint or mill finish.

**PERFORMANCE**

The diffuser shall be tested in accordance with ANSI/ASHRAE Standard 70. The manufacturer shall be able to provide published performance data.

**STANDARD FINISH**

The paint finish shall be #44 British White, powder coat paint, baked at 425°F. The paint thickness shall be 2.0 – 3.0 mils, gloss at 60° per ASTM D523-89 of 60 – 70%, pencil hardness per ASTM D3363-92A of H – 2H, crosshatch adhesion per ASTM D3359-83 of 5B, salt spray per ASTM B117-9048 of 1000 hours, humidity per ASTM D2247-92 of 1000 hours and conical mandrel per ASTM D522 of 1/8" conical bend, no cracking shows.

**ANTIMICROBIAL FINISH**

The paint finish shall be powder coat paint, baked at 425°F. The paint thickness shall be 2.0 – 3.0 mils, gloss at 60° per ASTM D523-89 of 55 – 65%, pencil hardness per ASTM D3363-92A of H – 2H, crosshatch adhesion per ASTM D3359-83 of 5B, salt spray per ASTM B117-9048 of 1000 hours, humidity per ASTM D2247-92 of 1000 hours and conical mandrel per ASTM D522 of 1/8" conical bend, no cracking shows.

- 1. SERIES: (XXXX)**  
5000 - Laminar Flow Panel
- 2. PATTERN: (XX)**  
00 - Cold Rolled Steel Pan and Face  
01 - Cold Rolled Steel Pan, Aluminum Face  
02 - Cold Rolled Steel Pan, Stainless Steel Face  
03 - Aluminum Pan and Face  
04 - Aluminum Pan, Stainless Steel Face  
05 - Stainless Steel Pan and Face
- 3. INLET: (XX)**  
6", 8", 10", or 12"
- 4. FRAME STYLE: (XXX)**  
F22 - Surface Mount  
F23 - Lay-in T-Bar
- 5. PANEL: (XX)x(XX)**  
12"x48"  
12"x60"  
12"x72"  
24"x24"  
24"x36"  
24"x48"  
24"x60"  
24"x72"  
36"x48"  
36"x60"  
36"x72"
- 6. FINISH: (XX)**  
01 - Mill  
10 - Alumican  
35 - Black  
44 - British White

CRITICAL ROOM PRODUCTS

5000

**SAMPLE CONFIGURATION: 5000 - 05 - 10 - F23 - 24x60 - 01**

## 5000HF Suggested Specification & Configuration

- 1. SERIES: (XXXXXX)**  
5000HF - Laminar Flow Panel with HEPA Filter Compatible Backpan
- 2. MATERIAL: (XX)**  
03 - Aluminum Backpan and Face  
05 - Stainless Steel Backpan and Face
- 3. INLET: (XX)**  
8", 10", or 12"
- 4. FRAME STYLE: (XXX)**  
F22 - Surface Mount  
F23 - Lay-in T-Bar
- 5. PANEL: (XX)x(XX)**  
24"x24"  
24"x36"  
48"x24"
- 6. FINISH: (XX)**  
01 - Mill  
10 - Alumican  
35 - Black  
44 - British White

*HEPA filter provided by others.*

### 5000HF

The non-aspirating, laminar flow diffuser designed to be fitted with a HEPA filter (by others) shall be a Krueger model 5000HF. The diffuser shall be of such a design to permit the HEPA filter to be removed from, or installed into, the backpan on an unobstructed path without the need to have access above the ceiling. The backpan shall also permit the seal on the HEPA filter to be the gel-pocket type.

The diffuser backpan shall be optimized and sized to provide correct airflow into the HEPA filter. The diffuser backpan shall have a hanger tab at all four corners to permit its attachment to the overhead structure.

The face of the diffuser shall be completely removable for sanitizing. The face shall be secured with quick turn fasteners and shall have safety cables to prevent its accidental removal.

The face of the diffuser shall have a free area not exceeding 15% to ensure true non-aspirating flow.

### PERFORMANCE

The diffuser shall be tested in accordance with ANSI/ASHRAE Standard 70. The manufacturer shall be able to provide published performance data.

### STANDARD FINISH

The paint finish shall be #44 British White, powder coat paint, baked at 425°F. The paint thickness shall be 2.0 – 3.0 mils, gloss at 60° per ASTM D523-89 of 60 – 70%, pencil hardness per ASTM D3363-92A of H – 2H, crosshatch adhesion per ASTM D3359-83 of 5B, salt spray per ASTM B117-9048 of 1000 hours, humidity per ASTM D2247-92 of 1000 hours and conical mandrel per ASTM D522 of 1/8" conical bend, no cracking shows.

### ANTIMICROBIAL FINISH

The paint finish shall be powder coat paint, baked at 425°F. The paint thickness shall be 2.0 – 3.0 mils, gloss at 60° per ASTM D523-89 of 55 – 65%, pencil hardness per ASTM D3363-92A of H – 2H, crosshatch adhesion per ASTM D3359-83 of 5B, salt spray per ASTM B117-9048 of 1000 hours, humidity per ASTM D2247-92 of 1000 hours and conical mandrel per ASTM D522 of 1/8" conical bend, no cracking shows.