

KITCHEN HOODS.



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ENGINEERING & DESIGN GUIDE FOR KITCHEN VENTILATION



INTRODUCTION TO KITCHEN HOODS

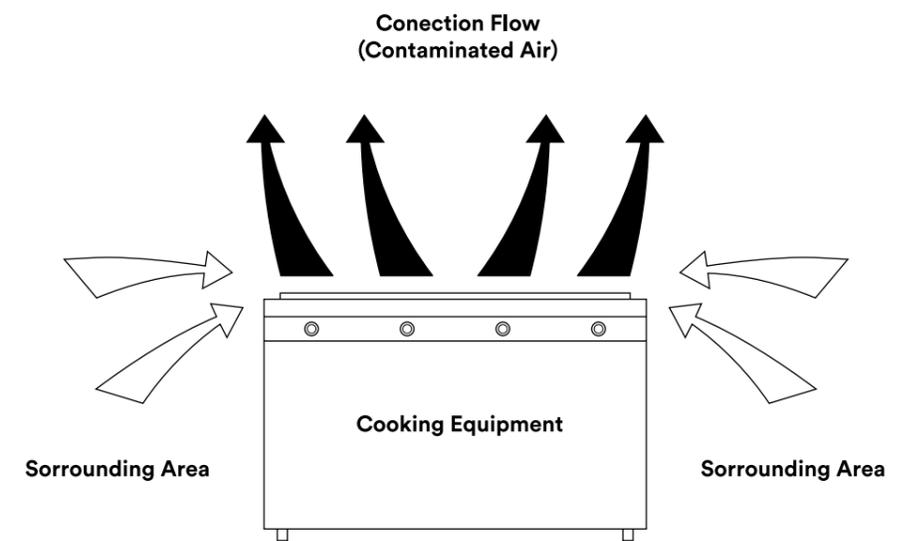
The most prominent component of kitchen ventilation system is the exhaust hood. The primary function of the hood is to capture and exhaust the convective heat, smoke, grease vapors and other contaminants generated by the cooking process in order to provide a safe, healthy and comfortable environment in the kitchen area.

It is a known fact that the heated surface of cooking equipment convects heat to air around it. As this air warms up, the air density decreases and it becomes lighter than the surrounding air. This lighter air creates an upward thermal current known as convection flow. The convection flow takes up the contaminants that are released during the cooking process and the surrounding air replaces the void created by the thermal current as illustrated in Figure 1. If the

convective heat is not removed directly above the cooking equipment, the contaminated air will spread throughout the kitchen area and even inside the restaurant. There will be a continuous accumulation of contaminants on the nearest walls and on the ceiling. lighter than the surrounding air.

This lighter air creates an upward thermal current known as convection flow. The convection flow takes up the contaminants that are released during the cooking process and the surrounding air replaces the void created by the thermal current as illustrated in Figure 1. If the convective heat is not removed directly above the cooking equipment, the contaminated air will spread throughout the kitchen area and even inside the restaurant. There will be a continuous accumulation of contaminants on the nearest walls and on the ceiling.

Figure 1: Contaminated air rising and replaced by the surrounding air.



As the convection flow rises from the cooking equipment's surface, it expand in a certain degree angle. To be able to capture by the exhaust hood the expanding convection flow, the hood must be extended on all open sides beyond the cooking

equipment. It should be noted that the overhang distance will be between the edge of cooking equipment and the edge of inside opening of exhaust hood. See Figure 2, Figure 3, Figure 4 and Figure 5.

Figure 2: Wall Type Exhaust Hood

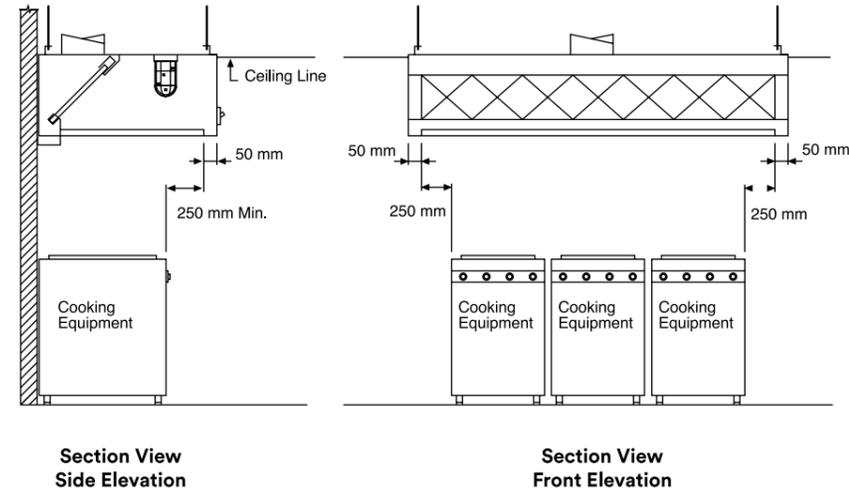


Figure 3: Wall Type Compensating Hood

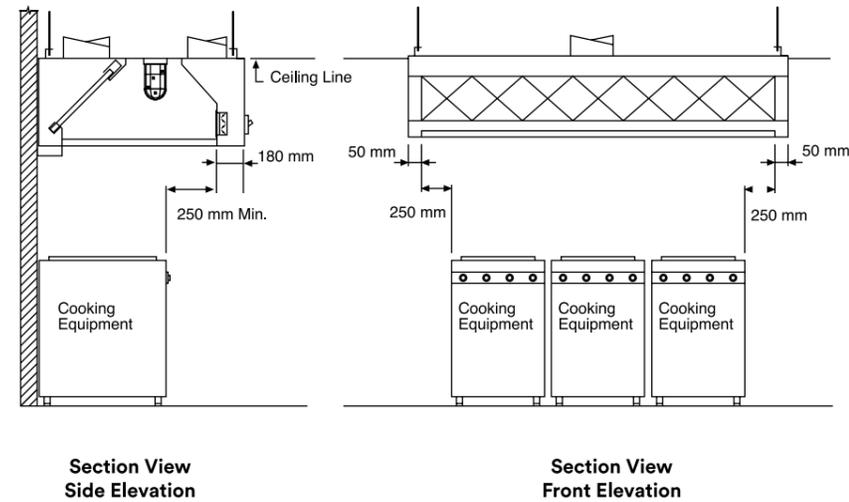


Figure 4: Island Type Exhaust Hood

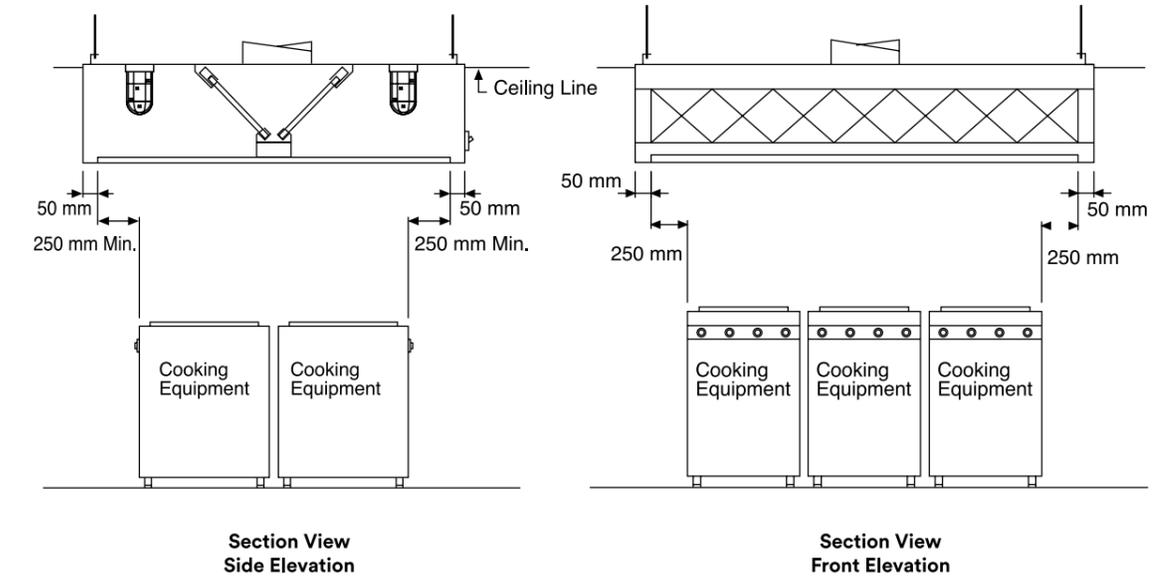
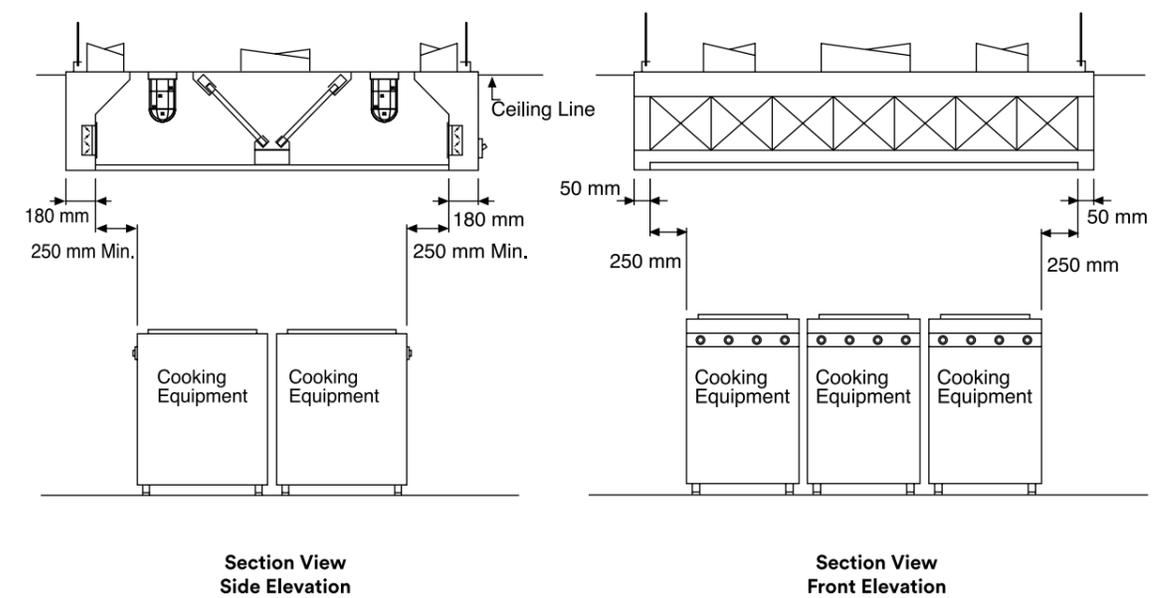


Figure 5: Island Type Compensating Hood



The exhaust volumetric flow rate requirement to be exhausted is based on the group of cooking equipment under the hood.

For areas where model codes or other regional codes have been adopted, the exhaust flow rate requirement for the exhaust hoods is dictated by the codes. The model code's required exhaust flow rates for exhaust hoods are typically calculated by multiplying the area (A) of hood opening by a given air velocity. For a wall mounted exhaust hood (3 sides open), the total exhaust airflow (Q) can be calculated by multiplying the area (in square feet) of hood opening by 100 ft/

minute (Q=Ax100). For the island type exhaust hood (4 sides open), the total exhaust flow rate is equal to the area of hood opening multiplied by 150 ft/minute (Q=Ax150).

If the details of cooking equipment is known, each type of cooking equipment is allocated a convection flow factor per square foot of surface area of the equipment. In Table 1, types of cooking equipment and their corresponding convection flow factors are presented. If a gas equipment is to be used, a flue outlet must be treated as a cooking surface with the same convection flow factor as gas cooking equipment.

Table 1: Convection Flow Factor (Cf)

Cooking Equipment	Gas (CFM/sq.ft.)	Electric (CFM/sq.ft.)
Coffee Maker	-	6
Microwave Oven, Toaster	-	6
Cheese Melter	35	25
Bain Marie	40	30
Light Duty Boiling Pan, Tilting Kettle	59	50
Pastry and High Output Bakery Oven	60	50
Steamer, Pressure Cooker	62	50
Bratt Pan, Tilt Skillet	63	52
Heavy Duty Boiling Pan	69	50
Open Top Range and Oven	69	50
Steaming and Roasting Oven	69	59
Convection Oven	75	59
Pizza Oven	75	59
Low and Medium Duty Grill	98	85
Griddle	95	85
Deep Fat Bratt Pan	98	85
Conveyer Pizza Oven	89	79
Deep Fat Fryer	99	85
Solid Top Range and Oven	118	100
Upright or Chain Broiler	148	108
Salamander or Steakhouse Grill	148	108
Chargrill, Charboiler	200	160
Chinese Work Range	216	-
Mesquite Grill	236	-

In Table 1, the convection flow factor (Cf) can be used only to determine the total quantity of rising contaminated air generated by the cooking equipment during the cooking process and does not include a safety factor to absorb crossdraft. It can be calculated by the following equation:

Qac = Asc x Cf (EQUATION - 1)

Where:

- Qac** = total quantity of contaminated air in cubic feet per minute (CFM)
- Asc** = surface area of cooking equipment in square feet (sq.ft.)
- Cf** = convection flow factor in CFM/sq.ft. (from Table 1)

To determine the total quantity of air to be exhausted for the hood over the cooking equipment, the total quantity of contaminated air (Qac) must be multiplied by the safety factor as presented in Table 2. It can be calculated by the following equation:

Qt = Qac x Sf (EQUATION - 2)

Where:

- Qt** = total quantity of air to be exhausted for the hood in cubic feet per minute (CFM)
- Qac** = total quantity of contaminated air (from EQUATION -1)
- Sf** = safety factor to absorb crossdraft for any given type of Exhaust hood (from Table 2).

Table 2: Safety Factor to Absorb Crossdraft (Sf)

Type of Hood	1 Side Open	3 Sides Open	4 Sides Open
Wall Type Exhaust Hood	1.05	1.25	-
Wall Type Compensating Hood	1.05	1.25	-
Wall Type Exhaust Hood	-	1.25	-
Wall Type Compensating Hood	-	1.25	-
Island Type Exhaust Hood	-	-	1.35
Island Type Compensating Hood	-	-	1.35

Example 1:

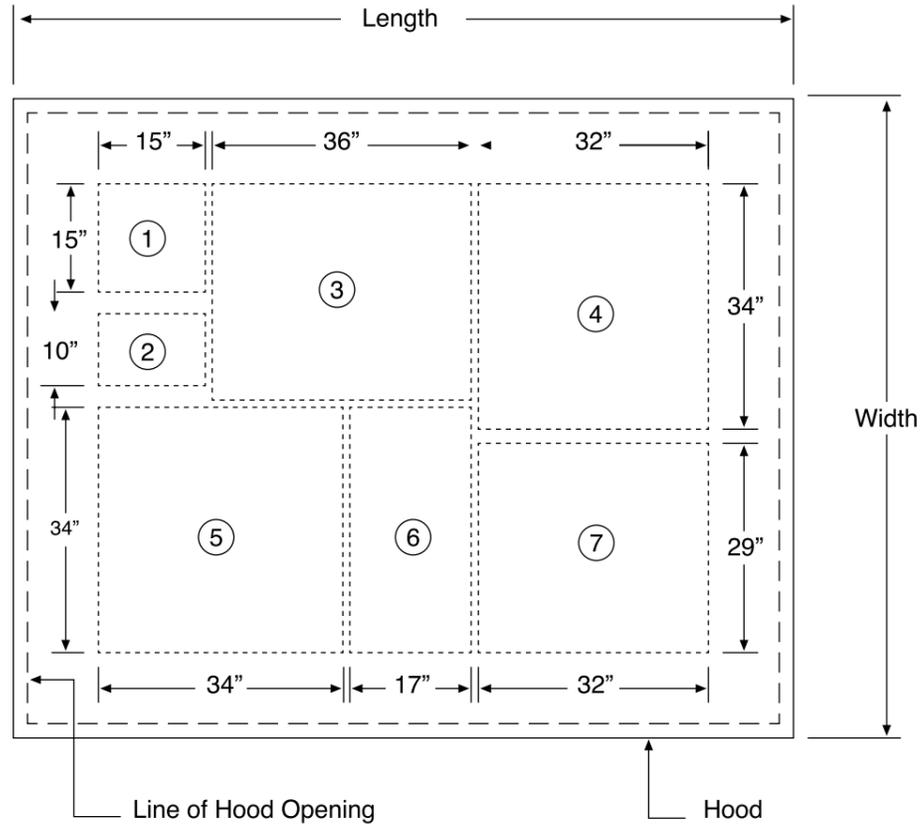
Determine the total quantity of air to be exhausted for the Island Type Exhaust Hood over the given type of cooking equipments as shown in Figure 6. By using Equation 1 and Equation 2, the total quantity of air is being calculated as tabulated below.

Equip. NO.	Type of Hood	Surface Size	Area (ASC)	Convection Flow (Cf)	Contaminated Air (Qca)
1	Toaster - Electric	15" x 15"	1.6	6	9.6
2	Cheese Melter - Electric	15" x 10"	1	25	25
3	Griddle - Electric	36" x 30"	7.5	85	637.5
4	Charbroiler - Gas	32" x 34"	7.6	200	1520
5	Convection Oven - Electric	34" x 34"	8	59	472
6	Fryer - Electric	17" x 34"	4	85	340
7	Open Top Range - Electric	32" x 29"	6.4	50	320
Total:					3324.1

Qt = Qac x Sf Qt = 3324.1 x 1.35 Qt = 4487.54 CFM

The total quantity of air to be exhausted (Qt) for the Exhaust Hood Island Type as shown in Figure 6 has been calculated as 4488 CFM.

Figure 6: Cooking Equipment Under Island Type Exhaust Hood for Example 1



Example 2:

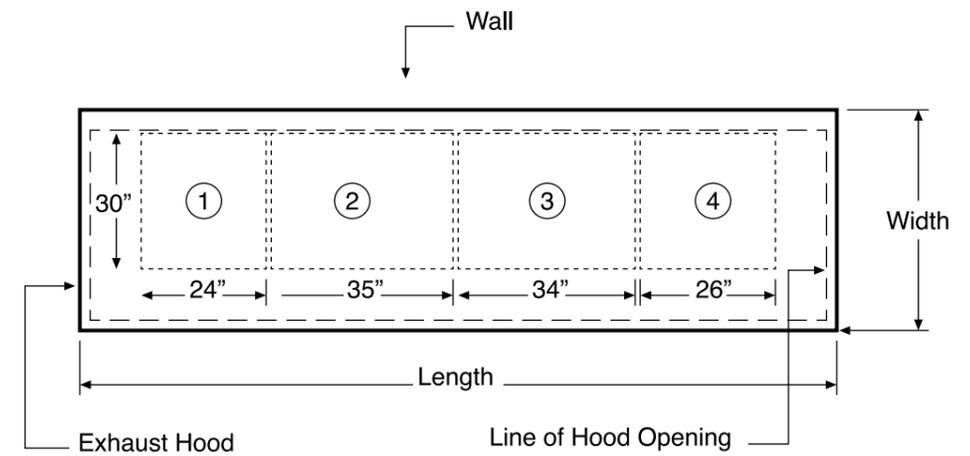
Determine the total quantity of air to be exhausted for the Wall Type Exhaust Hood over the given type of cooking equipments as shown in Figure 7. By using Equation 1 and Equation 2, the total quantity of air is being calculated as tabulated below.

Equip. NO.	Type of Hood	Surface Size	Area (ASC)	Convection Flow (Cf)	Contaminated Air (Qca)
1	Griddle - Electric	24" x 30"	5	85	425
2	Open Top Range - Electric	35" x 30"	7.3	50	365
3	Charbroiler - Gas	34" x 30"	7.1	200	1420
4	Deep Fat Fryer - Electric	26" x 30"	5.4	85	459
Total:					2669

$$Qt = Qac \times Sf \quad Qt = 2669 \times 1.25 \quad Qt = 3336.25 \text{ CFM}$$

The total quantity of air to be exhausted (Qt) for the Wall Type Exhaust Hood as shown in Figure 7 has been calculated as 3336 CFM.

Figure 7: Cooking Equipment Under Wall Type Exhaust Hood for Example 2



Grease filters should be provided in hoods to prevent a large amount of grease accumulation inside the ductworks, fan blades, walls and roof tops. Grease accumulation inside the ductworks and fan blades will reduce the designed efficiency of exhaust fan and will not work properly. Grease filters should be installed at an angle between 45 to 60 degrees from the

horizontal axis to prevent grease from dripping back to the surface of cooking equipment.

To select the quantity and size of grease filters, Table 3 and Table 4 shows typical filter rating datas and effective size.

Table 3: Baffle Type Grease Filter

Flow Rate	Filter Nominal Size and Static Pressure Loss (in W.G.)						
	10" x 20"	12" x 20"	16" x 16"	16" x 20"	16" x 25"	20" x 20"	20" x 25"
200	0.25						
225	0.31	0.28					
250	0.38	0.35	0.32				
275	0.46	0.41	0.37	0.15			
300	0.55	0.46	0.42	0.18	0.11		
325	0.63	0.49	0.47	0.23	0.13	0.15	
350	0.72	0.55	0.52	0.27	0.15	0.17	0.13
375	0.84	0.61	0.57	0.32	0.18	0.19	0.15
400	0.95	0.67	0.62	0.37	0.22	0.23	0.17
425	1.06	0.72	0.66	0.42	0.25	0.26	0.19
450	1.17	0.78	0.75	0.47	0.28	0.3	0.21
475	1.32	0.83	0.81	0.52	0.32	0.34	0.23
500	1.45	0.89	0.87	0.57	0.36	0.38	0.25
525	1.61	0.95	0.93	0.62	0.41	0.42	0.26
550	1.75	1.04	1.01	0.66	0.44	0.45	0.27
575	1.91	1.11	1.07	0.75	0.48	0.49	0.29
600		1.18	1.14	0.81	0.52	0.54	0.32
625		1.27	1.22	0.87	0.57	0.59	0.34
650		1.37	1.33	0.93	0.62	0.64	0.36
675		1.49	1.46	1.01	0.67	0.69	0.38
700		1.59	1.55	1.07	0.72	0.74	0.41
725		1.71	1.65	1.14	0.77	0.79	0.44
750		1.81	1.75	1.22	0.82	0.84	0.46
775			1.87	1.31	0.88	0.89	0.49
800				1.37	0.93	0.94	0.53
825				1.46	1.01	1.02	0.56
850				1.55	1.06	1.07	0.61
875				1.65	1.12	1.13	0.64
900				1.75	1.17	1.18	0.67
925				1.87	1.23	1.25	0.71

Table 4: Baffle Type Grease Filter

Nominal Size (HxW)	10" x 20"	12" x 20"	16" x 16"	16" x 20"	16" x 25"	20" x 20"	20" x 25"
Effective Size (HxW)	8" x 18"	10" x 18"	14" x 15"	14" x 18"	14" x 24"	18" x 18"	18" x 24"

By using the following equation, the size and quantity of grease filter can be selected.

$$\text{Quantity of Filters} = \frac{Q_t \text{ (from Equation-2)}}{\text{CFM/Filter (from Table 3)}} \quad \text{(Equation-3)}$$

Where Q_t = total quantity of air to be exhausted

$$\text{Total length of filter bank} = \text{Quantity of filters} \times \text{Effective Width of filter (Table 4)} \quad \text{(Equation-4)}$$

Example 3:

Determine the quantity of filters to be used for the Wall Type Exhaust Hood shown in Figure 7. In Example 2, the total quantity of air to be exhausted has been calculated as 3336 CFM.

Solution:

Assume that the cooking equipment has been positioned without spacing in between. The total length of space occupied by the cooking equipment will be 119". The total length of exhaust hood will be 119" + 24" (total overhang for both end of hood) is equal to 143". Since 143" exceeds the 3000 mm or 118" maximum length of a single segment hood, it will be divided into 2 to become a two segment hood. The length of each hood will be 71 1/2". The preliminary length of filter bank will be equal to the length of hood 71 1/2"-5" (side spacer) = 66 1/2". Since the hood is in two segments, the total quantity of air (Q_t) to be exhausted will be divided by 2 so that it will become $Q_t = Q_{t1} + Q_{t2}$. The quantity of air to be exhausted for one hood (Q_{t1} or Q_{t2}) is 1668 CFM.

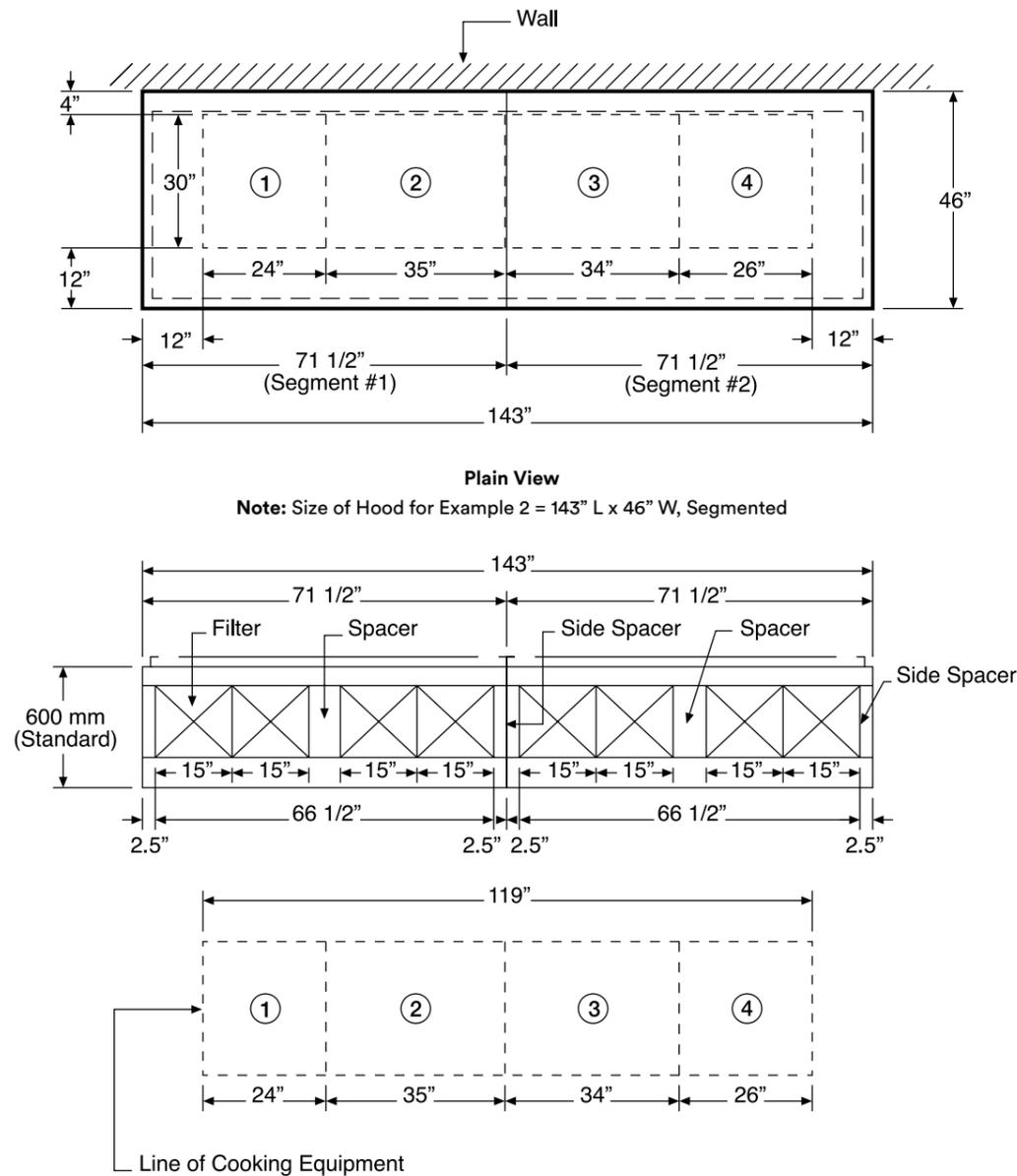
By using EQUATION-3, the quantity of filters for one segment will be:

$$\begin{aligned} \text{Quantity of Filters} &= \frac{Q_{t1} \text{ (from CFM of one segment)}}{\text{CFM/Filter}} \\ &= \frac{1668 \text{ CFM}}{425 \text{ CFM}} \end{aligned}$$

$$\text{Quantity of Filters} = 3.9 \text{ or } 4 \text{ pcs}$$

The preliminary length of filter bank is 66 1/2" as mentioned above. From Table 4, a nominal size of 16"x16" with effective width (W) of 15" has been selected. The total width of 4 filters will become 60" and will be fitted to the preliminary length of filter bank which is 66 1/2". The selected filter 16"x16" with a capacity to exhaust 425 CFM will have a static pressure loss of 0.66 in. W.G.. No matter how many filters will be used with the same capacity to exhaust air, the static pressure loss will be the same. Figure 8 shows the position of filters.

Figure 8



Plain View
Note: Size of Hood for Example 2 = 143" L x 46" W, Segmented

Section View - Front Elevation
Note: Position of Filters as Calculated on Example 3

The exhaust ductwork conveys exhaust air from the hood to outdoors along with grease, smoke and odors. To be effective, ducts must be sized based on a minimum air velocity of 1500 Ft/min and a maximum velocity of 1800 Ft/min. The duct air velocity can be calculated by the equation.

$$V = 144Qt/A \text{ (Equation-5)}$$

Where: Qt = total quantity of air to be exhausted in cubic feet per minute (CFM)
 A = cross sectional area of duct in square inch (sq.in.)

To determine the proper size of exhaust fan, the total static pressure loss on the exhaust system associated with the following must be known:

1. The total hood entry loss which can be calculated as:

$$\text{Total Entry Loss} = C \times Vp + \text{filter static pressure loss} + 0.1 \text{ in. W.G.}$$

Where $C = 0.5$
 Vp = velocity pressure on the duct collar (in. W. G.)
 $Vp = \frac{\text{velocity square}}{4005 \text{ square}}$

Example 4:
 Determine the duct size and the total static pressure loss for a hood exhausting 3600 CFM with a 5 feet long of duct from the hood up to the roof. The duct air velocity selected is 1600 Ft/min. The baffle type grease filter size 16"H x 16"W with a flow rate of 450 CFM and static pressure loss of 0.75" W.G. will be used.

The calculation are as follows:
 1. By using EQUATION 5, $V=144 \times Qt$ divided by A . With duct air velocity of 1600 Ft/min, the cross sectional area (A) of duct will be:
 $A = 144 \times 3600 \text{ CFM} \text{ divided by } 1600 \text{ Ft/min}$
 $A = 324 \text{ sq.in.}$

A duct size 18" x 18" with equivalent cross sectional area of 324 sq.in. has been selected.

$$Vp = \frac{(1600 \times 1600)}{(4005 \times 4005)}$$

$$Vp = 0.16" \text{ W.G.}$$

$$2. \text{ The total hood entry loss} = \{(C \times Vp) + \text{filter static pressure loss} + 0.1\}$$

$$= \{(0.5 \times 0.16) + 0.75 + 0.1\}$$

$$= 0.93" \text{ W.G.}$$

3. Losses on straight duct:
 A rectangular duct 18" x 18" has a circular equivalent of 19.7". With a duct air velocity of 1600 Ft/min, the friction loss is 0.19" W.G./100ft or 0.0019" W.G./ft.

$$\text{Duct loss} = 5\text{ft} \times 0.0019" \text{ W.G./ft}$$

$$= 0.0095" \text{ W.G.}$$

4. Assume Losses due to high wind velocity = 0.15" W.G.

$$5. \text{ Total Static Pressure} = 0.93 + 0.0095 + 0.15$$

$$= 1.09" \text{ W.G.}$$

A belt drive upblast roof exhaust fan with a capacity of 3600 CFM and with static pressure of 1.09" W.G. can be selected for the example calculation.

Air exhausted by the kitchen hood must be replaced. Replacement air (make-up air) can be distributed in the kitchen area through a ceiling register or it can be an integral part of the hood. The exhaust fan and supply fan should be electrically interlocked for simultaneous operation.

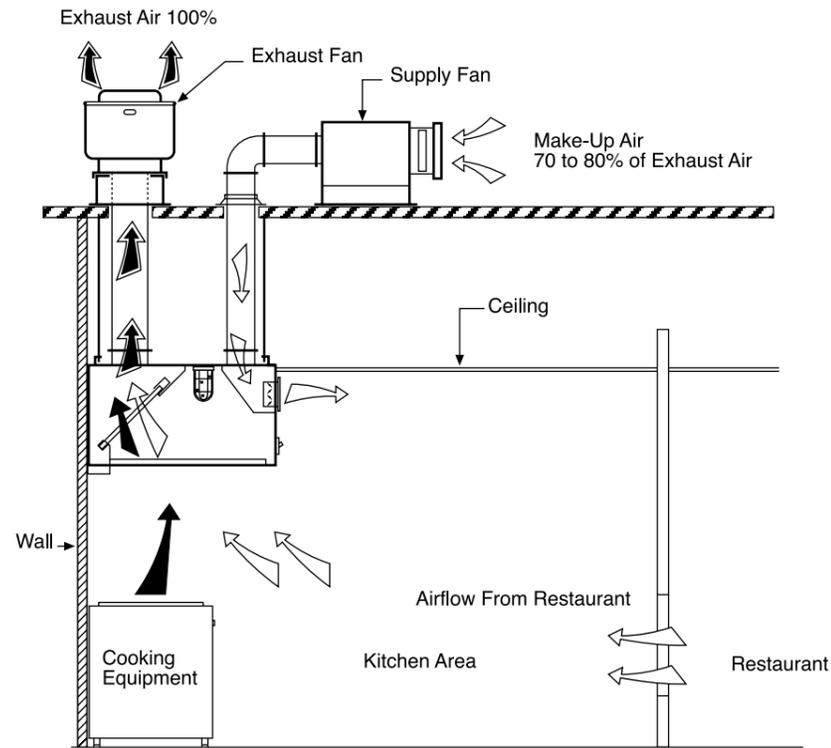
The actual quantity of make-up air vary with the following types of hoods:

1. Compensating Hood with Front Face Discharge

This method of distributing make-up air into the kitchen area has many advantages. The make-up air will be distributed first to other corner of kitchen area. This method will help to reduce heat gains in the area and can move unwanted odors

towards the kitchen hood and then it will be exhausted. As shown in Figure 9, the typical make-up air quantity is from 70% to 80% of the total exhaust air, depending on the air balance desired.

Figure 9: Compensating Hood with Front Face Discharge

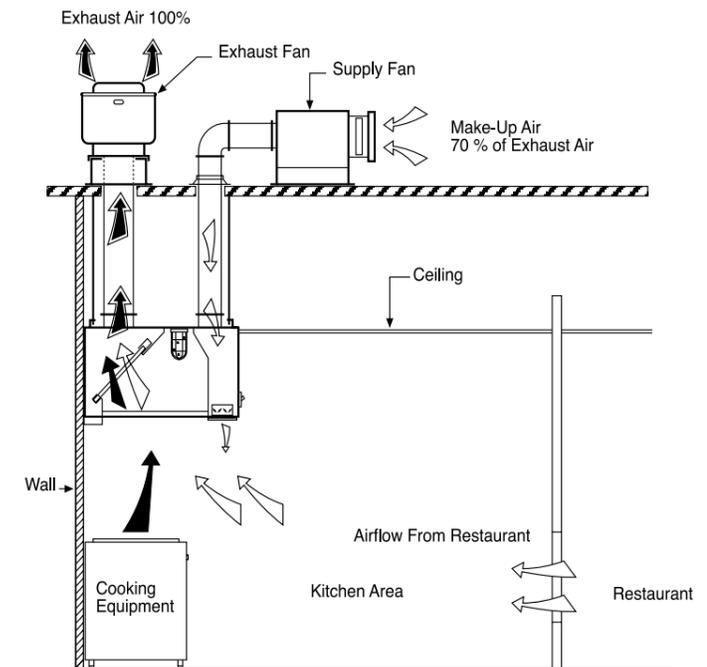


2. Compensating Hood with Downward Discharge

This method of distributing make-up air into the kitchen area is typically used if the cooking staff is desired to help relieve the effects of severe radiant heat generated by the heavy duty cooking equipment. Discharge air velocity must kept

minimal to avoid air turbulence at the cooking equipment surface and discomfort to cooking staff. The typical make-up air quantity is 70% of the total exhaust air as shown in Figure 10.

Figure 10: Compensating Hood with Downward Discharge



3. Compensating Hood with Internal Discharge

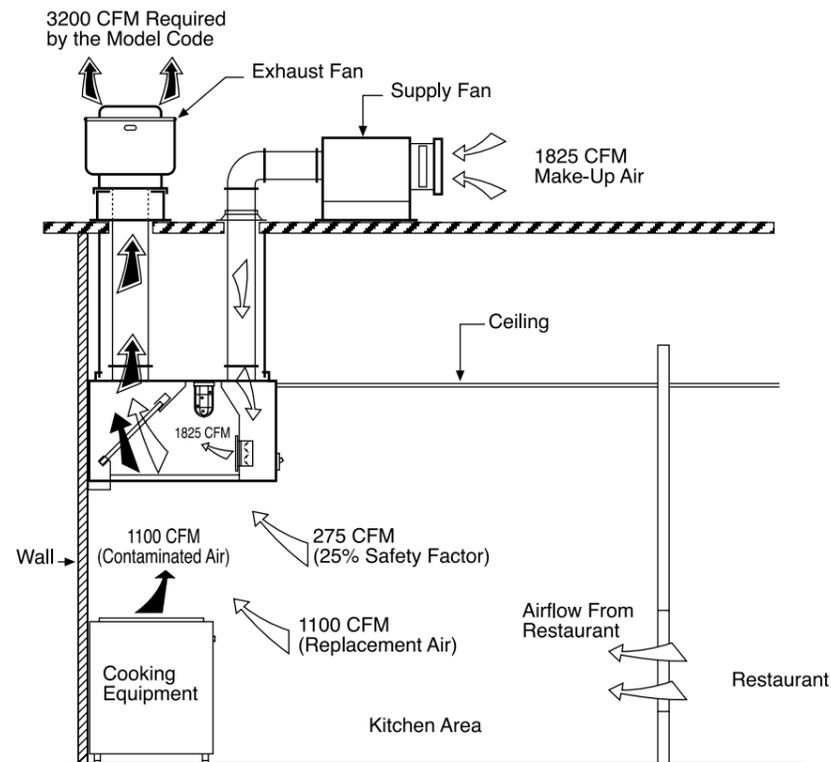
In this method the hood is also referred to as a short-circuit hood.

The make-up air (short-circuit air) is introduced inside the hood. The amount of make-up air that can be introduced inside the hood varies with types of cooking equipment. As illustrated in Figure 1, the cooking equipment create a convection flow that takes up a certain volume of contaminants generated during the cooking process. The hood must be drawn this volume of air (with safety factor) from the kitchen area in addition to short-circuit air to be

exhausted. If this volume of air to be exhausted is less than the volume of contaminated air (with safety factor) generated by the cooking equipment, a certain amount of contaminated air will spill out of the hood.

If the total quantity of air to be exhausted is required to comply with the model codes, the amount of short-circuit air will be the difference between the model code exhaust air volume and the amount of contaminated air (with safety factor) generated by the cooking equipment. In Figure 11, an example has been illustrated.

Figure 11: Compensating Hood with Internal Discharge

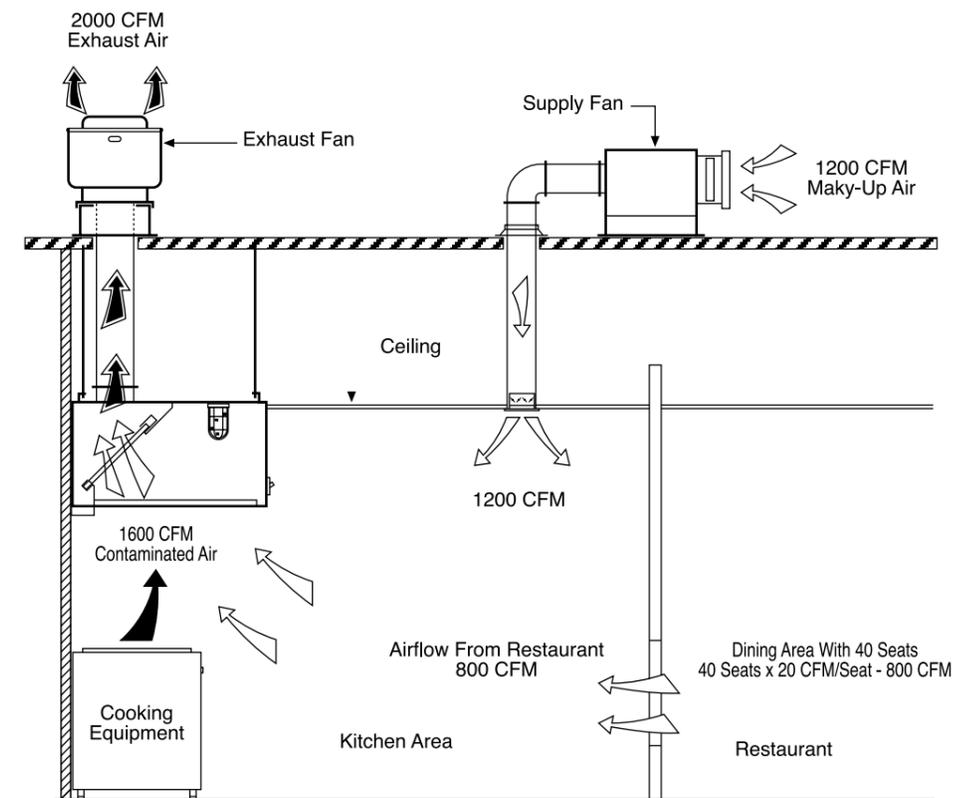


4. Exhaust Hood Only

In this method, the make-up air is distributed in the kitchen area through a ceiling register. The exhaust hood drawn the equivalent exhaust volume of air from the kitchen area in which a portion of the airflow is coming from the restaurant. The air volume required to be drawn from the restaurant depends on the quantity of occupants in the dining area.

The outdoor air requirement to be introduced in the dining area is 20 CFM/person based on the maximum occupancy of 70 persons per 100 sq.m. and 100 persons per 100 sq.m. for cafeterias and fast food restaurants. In Figure 12, an example has been illustrated.

Figure 12: Exhaust Hood Only



REFERENCES

1. ASHRAE Handbook 1999, HVAC Applications, Chapter 30 - Kitchen Ventilation.
2. ASHRAE Technical Data Bulletin , January 1992, Volume 8 Number 4 - Developments in Kitchen Ventilation Technology.
3. ASHRAE Standard 62-1981R, August 1988 - Indoor Air Quality Chapter 11 - Table 11-2 Outdoor Air Requirements for Ventilation of Commercial Facilities
4. DW/171, First Edition 1999 - Standard for Kitchen Ventilation Systems
5. NFPA 96, 1998 Edition - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
6. SMACNA, Third Edition 1990 - HVAC Systems Duct Design



WALL TYPE EXHAUST HOOD





Type SHW - 100

SAFID Hood type SHW - 100 is only exhaust hood, designed for wall type applications; where all air removed comes from outside the hood (no make-up air through the hood).

Construction:

Hoods are constructed of 18 gauge (1.2mm thickness) stainless steel type 304 with no. 4 finish. All unexposed surfaces are to be of gauge 22 (0.8mm thickness) stainless steel type 304, 2B mill finish.

Seams are continuously welded liquidtight on the hood's lower outermost perimeter (NFPA 96) with all exposed welds to be grinded and polished to match no. 4 finish.

Hoods to include filter housing constructed of the same materials as hood.

Filters:

All filters to be of the baffle type constructed of stainless steel type 304, no. 4 finish, supplied with fold down handles for easy removing and cleaning. Filter drain all grease into a full length grease trough made of stainless steel pitched to drain grease from filter and exhaust plenum into a removable grease cup.

Lights:

Hoods will be supplied with UL listed vaporproof incandescent light fixtures prewired to a junction box mounted on top of the hood, for field connection to power supply.

Dimensional Limitations:

Type SHW - 100 is available in lengths from 1000mm through 3000mm and in widths from 650mm to 1100 as a single section.

Standard Height:

600 mm

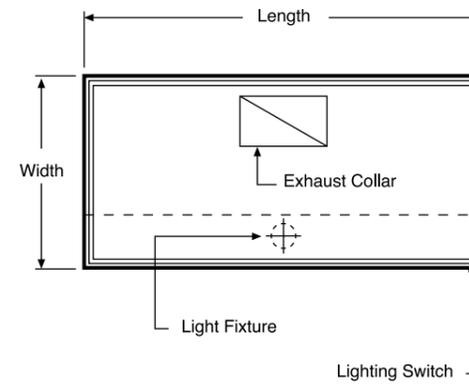
Height Range:

From 400mm to 800mm can be supplied upon request.

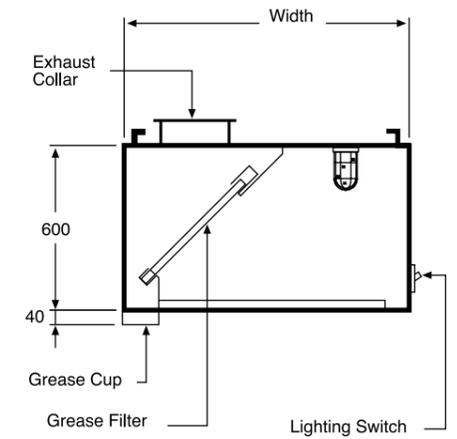
For greater lengths, hoods in multiple sections to be joined on site by bolts and nuts.

SHW - 100

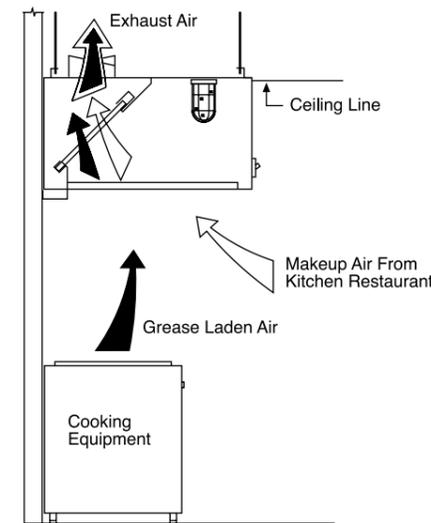
Plan View



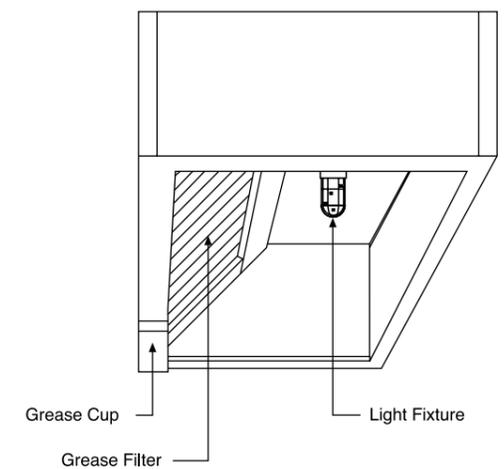
Section View



Typical Air Flow Pattern



Perspective View





COMPENSATING HOOD WALL TYPE



SHW - 200

WALL TYPE SUPPLY & EXHAUST HOOD



Type SHW - 200

SAFID Hood type SHW - 200 series are supply and exhaust hood, designed for wall mounted applications; where tempered make-up air is delivered through grilles at the hood front face, internal side or perimeter downward discharge.

Construction:

Hoods are constructed of 18 gauge (1.2mm thickness) stainless steel type 304 with no. 4 finish. All unexposed surfaces are to be of gauge 22 (0.8mm thickness) stainless steel type 304, 2B mill finish.

Seams are continuously welded liquidtight on the hood's lower outermost perimeter (NFPA 96) with all exposed welds to be grinded and polished to match no. 4 finish.

Hoods to include filter housing constructed of the same materials as hood.

Filters:

All filters to be of the baffle type constructed of stainless steel type 304, no. 4 finish, supplied with fold down handles for easy removing and cleaning. Filter drain all grease into a full length grease trough made of stainless steel pitched to drain grease from filter and exhaust plenum into a removable grease cup.

Lights:

Hoods will be supplied with UL listed vaporproof incandescent light fixtures prewired to a junction box mounted on top of the hood, for field connection to power supply.

Dimensional Limitations:

Type SHW - 200 series is available in lengths from 1000mm through 3000mm and in widths from 850mm (for SHW - 200 A, 200 C, 200 AC), 1100mm (for SHW - 200 B, 200 AB, 200 BC) and up to 1250mm as a single section.

Standard Height:

600 mm

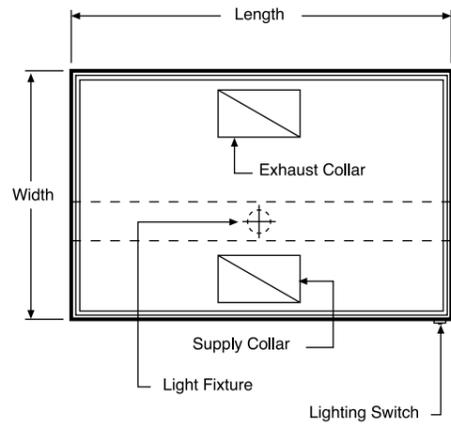
Height Range:

From 400mm to 800mm can be supplied upon request.

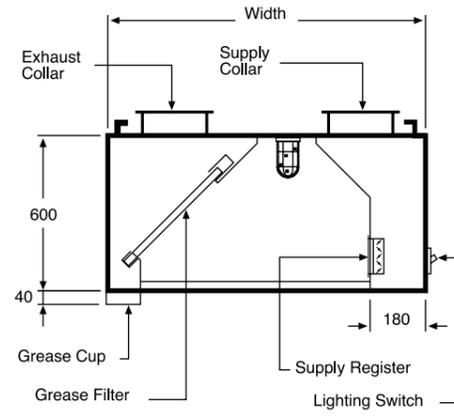
For greater lengths, hoods in multiple sections to be joined on site by bolts and nuts.

SHW - 200 SERIES: SHW - 200 A

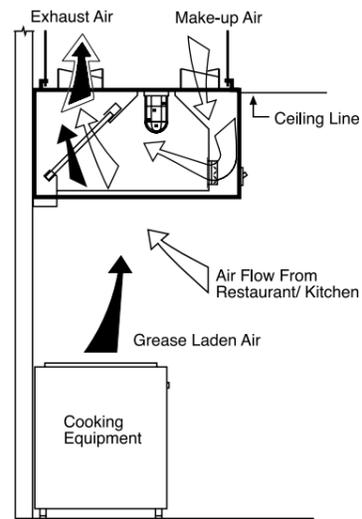
Plan View



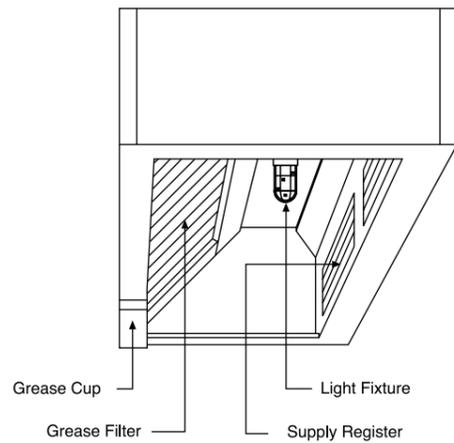
Section View



Typical Air Flow Pattern

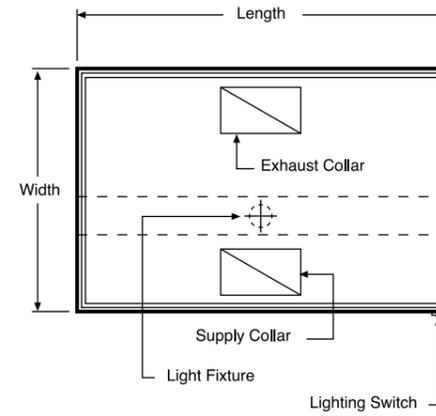


Perspective View

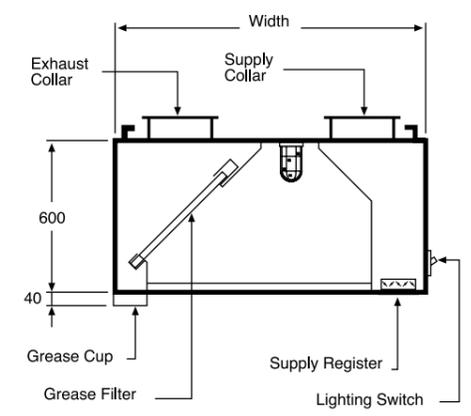


SHW - 200 SERIES: SHW - 200 B

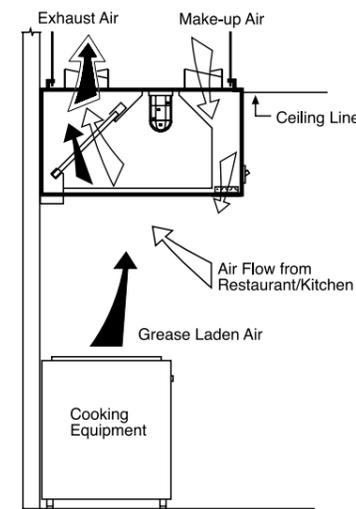
Plan View



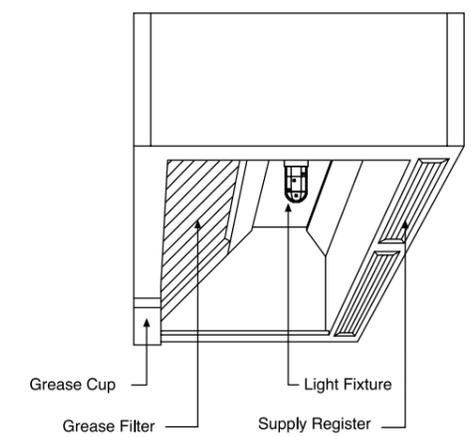
Section View



Typical Air Flow Pattern

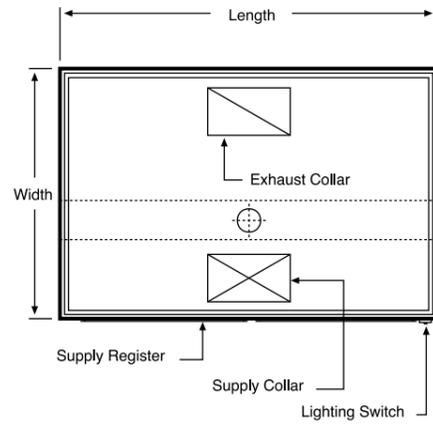


Perspective View

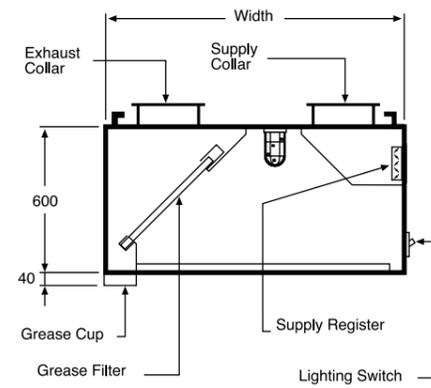


SHW - 200 SERIES: SHW - 200 C

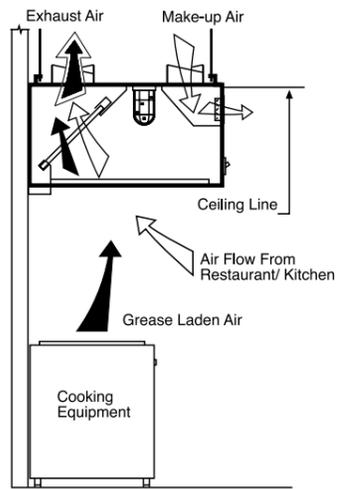
Plan View



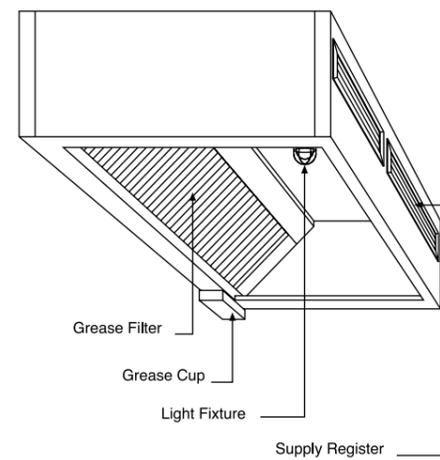
Section View



Typical Air Flow Pattern

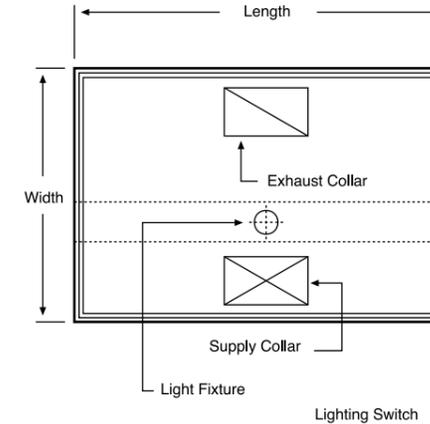


Perspective View

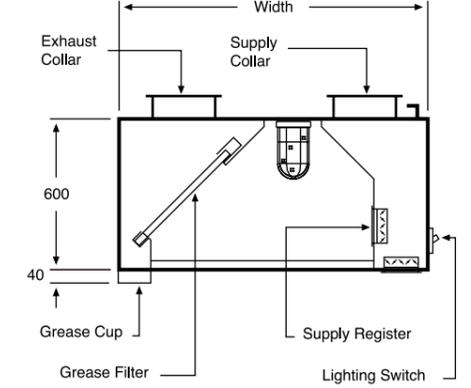


SHW - 200 SERIES: SHW - 200 AB

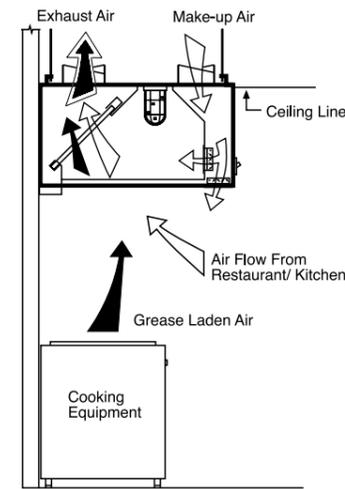
Plan View



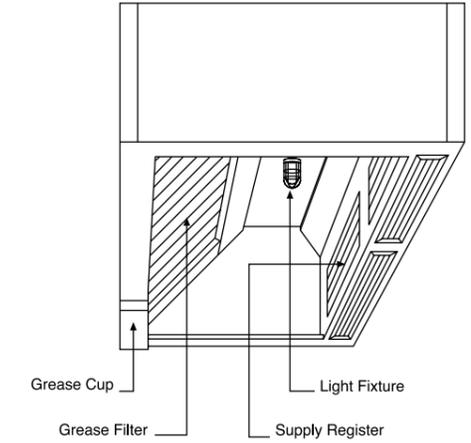
Section View



Typical Air Flow Pattern

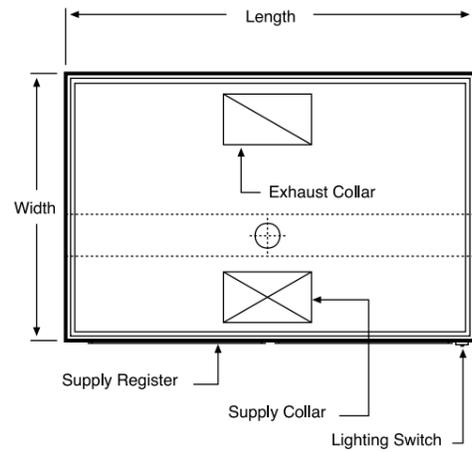


Perspective View

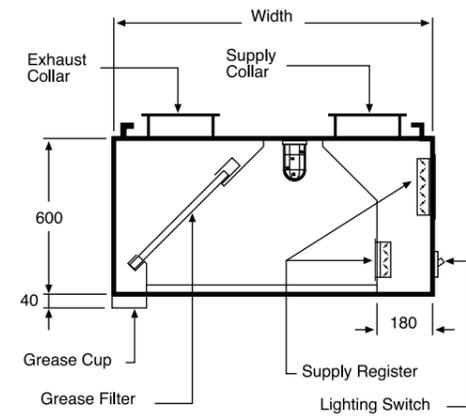


SHW - 200 SERIES: SHW - 200 AC

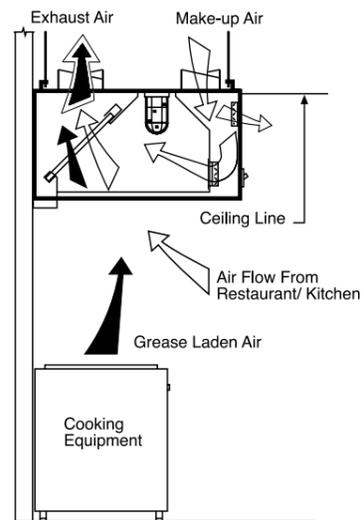
Plan View



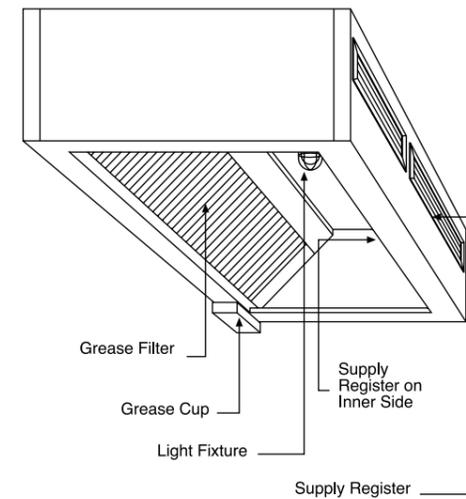
Section View



Typical Air Flow Pattern

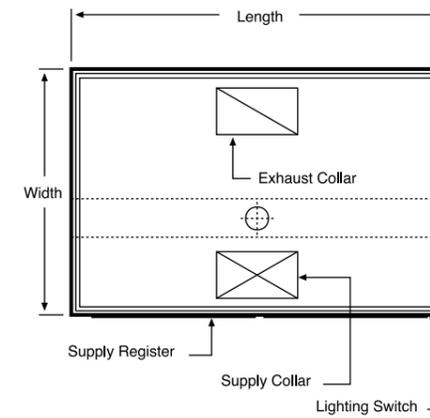


Perspective View

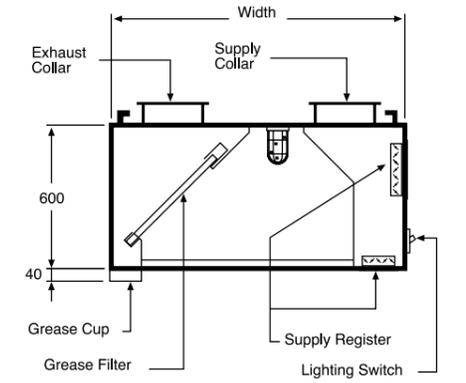


SHW - 200 SERIES: SHW - 200 BC

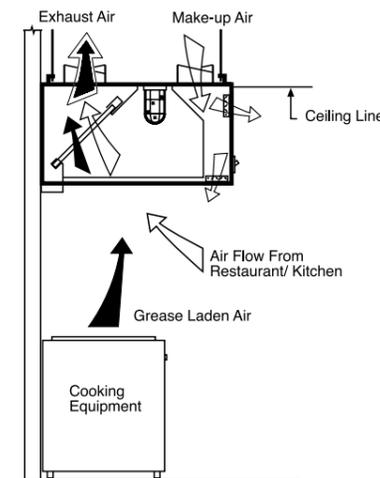
Plan View



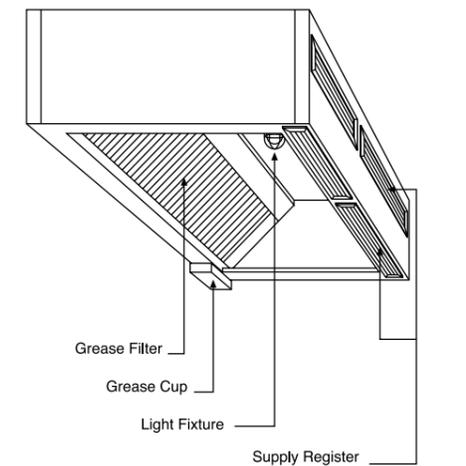
Section View



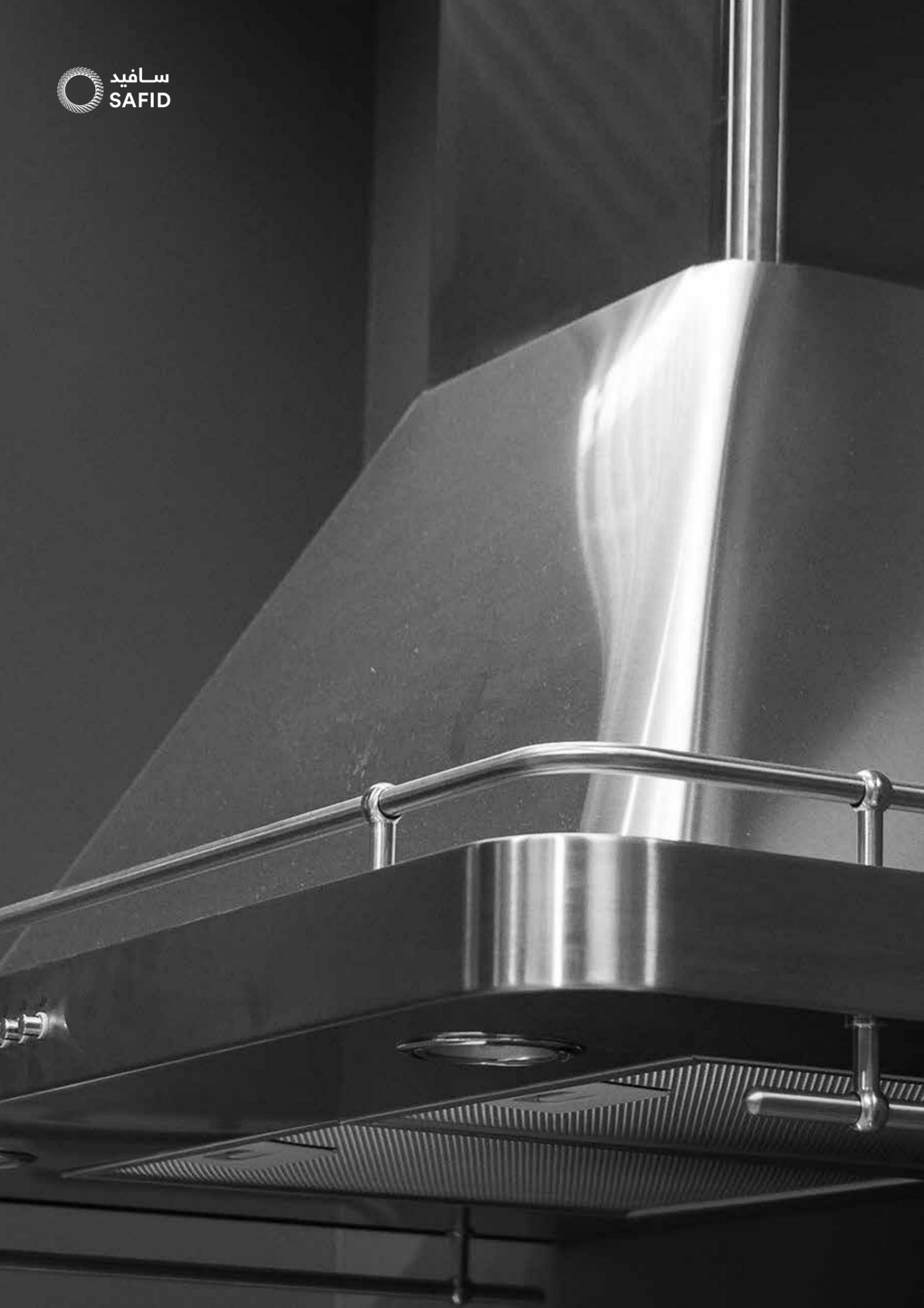
Typical Air Flow Pattern



Perspective View



ISLAND TYPE EXHAUST HOODS





Type SHI - 100

SAFID Hood type SHI - 100 is an exhaust only hood, designed for island type applications; where all air removed comes from outside the hood (no make-up air through the hood).

Construction:

Hoods are constructed of 18 gauge (1.2mm thickness) stainless steel type 304 with no. 4 finish. All unexposed surfaces are to be of gauge 22 (0.8mm thickness) stainless steel type 304, 2B mill finish.

Seams are continuously welded liquidtight on the hood's lower outermost perimeter (NFPA 96) with all exposed welds to be grinded and polished to match no. 4 finish.

Hoods to include filter housing constructed of the same materials as hood.

Filters:

All filters to be of the baffle type constructed of stainless steel type 304, no. 4 finish, supplied with fold down handles for easy removing and cleaning. Filter drain all grease into a full length grease trough made of stainless steel pitched to drain grease from filter and exhaust plenum into a removable grease cup.

Lights:

Hoods will be supplied with UL listed vaporproof incandescent light fixtures prewired to a junction box mounted on top of the hood, for field connection to power supply.

ISLAND TYPE EXHAUST ONLY

Dimensional Limitations:

Type SHI - 100 is available in lengths from 1150mm through 3000mm and in widths from 1150mm to 2000 as a single section.

Standard Height:

600 mm

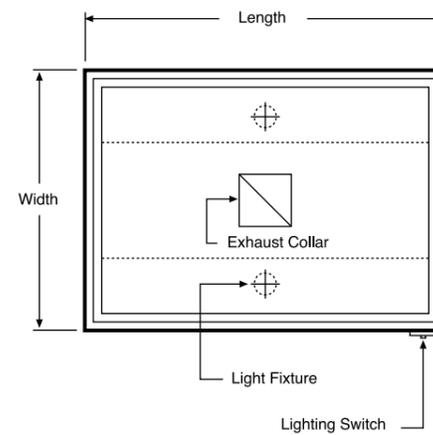
Height Range:

From 400mm to 800mm can be supplied upon request.

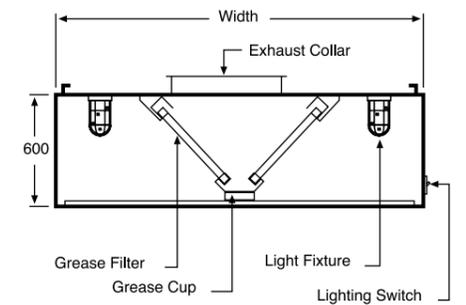
For greater lengths, hoods in multiple sections to be joined on site by bolts and nuts.

SHI - 100

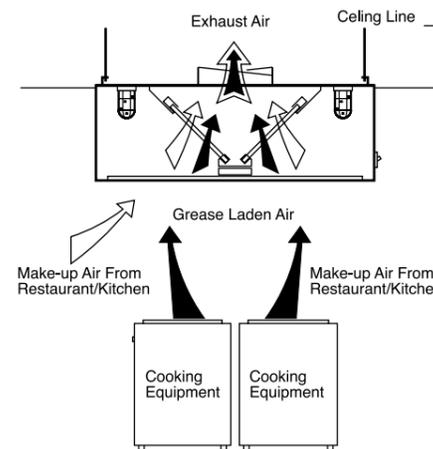
Plan View



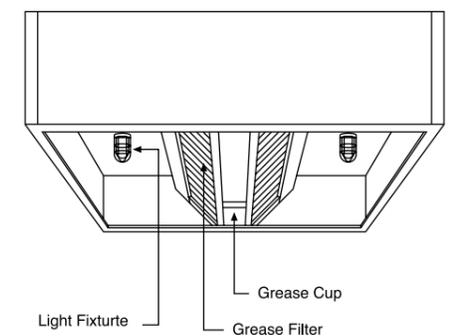
Section View



Typical Air Flow Pattern



Perspective View



ISLAND TYPE SUPPLY AND EXHAUST COMPENSATING HOOD



Type SHI - 200

SAFID Hood type SHI - 200 series are supply and exhaust hoods, exhaust hood, designed for island type applications; where tempered make-up air is delivered through grilles at the hood front face, internal side or perimeter downward discharge.

Construction:

Hoods are constructed of 18 gauge (1.2mm thickness) stainless steel type 304 with no. 4 finish. All unexposed surfaces are to be of gauge 22 (0.8mm thickness) stainless steel type 304, 2B mill finish.

Seams are continuously welded liquidtight on the hood's lower outermost perimeter (NFPA 96) with all exposed welds to be grinded and polished to match no. 4 finish.

Hoods to include filter housing constructed of the same materials as hood.

Filters:

All filters to be of the baffle type constructed of stainless steel type 304, no. 4 finish, supplied with fold down handles for easy removing and cleaning. Filter drain all grease into a full length grease trough made of stainless steel pitched to drain grease from filter and exhaust plenum into a removable grease cup.

Lights:

Hoods will be supplied with UL listed vaporproof incandescent light fixtures prewired to a junction box mounted on top of the hood, for field connection to power supply.

Dimensional Limitations:

Type SH1 - 200 series is available in lengths from 1150mm through 3000mm and in widths from 1650mm (for SHI - 200 A, 200 C, 200 AC), 1975 mm (for SHI - 200 B, 200 AB, 200 BC) and up to 2000mm as a single section.

Standard Height:

600 mm

Height Range:

From 400mm to 800mm can be supplied upon request.

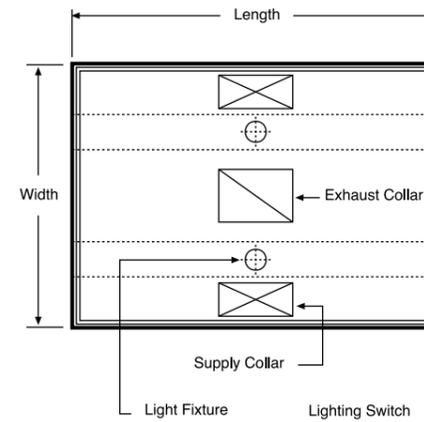
For greater lengths, hoods in multiple sections to be joined on site by bolts and nuts.



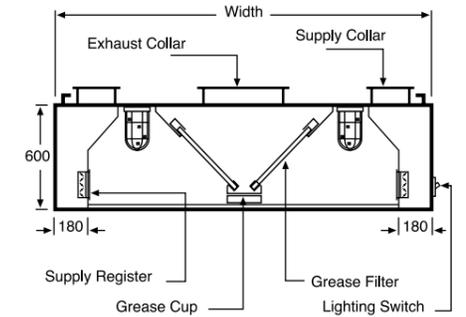
ISLAND TYPE SUPPLY AND EXHAUST COMPENSATING HOOD

SHI - 200 SERIES: SHI - 200 A

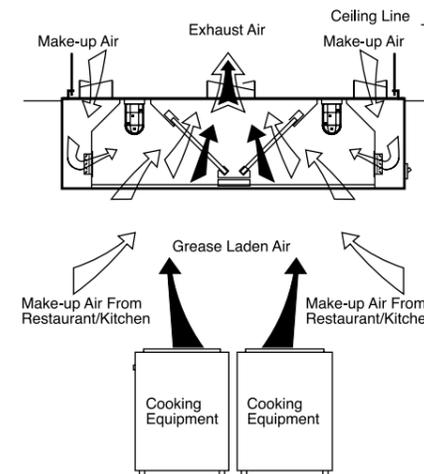
Plan View



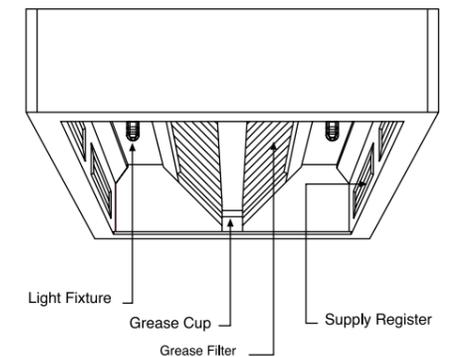
Section View



Typical Air Flow Pattern

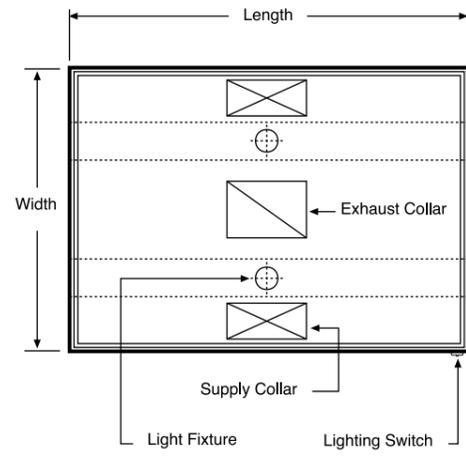


Perspective View

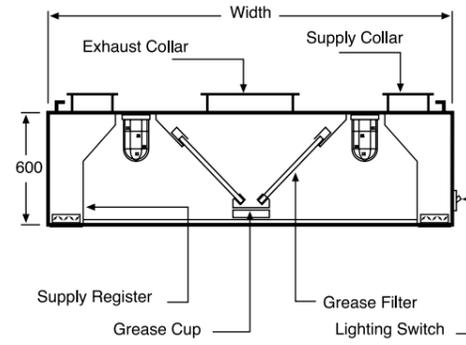


SHI - 200 SERIES: SHI - 200 B

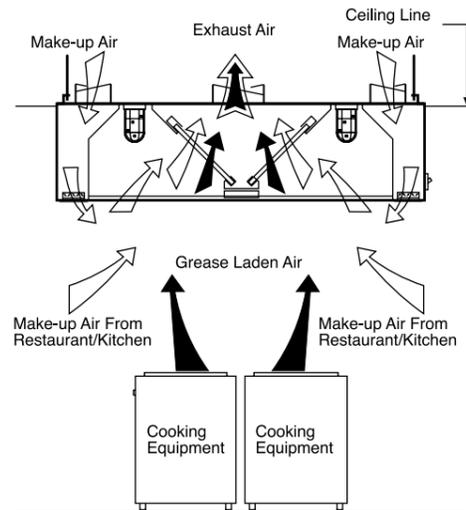
Plan View



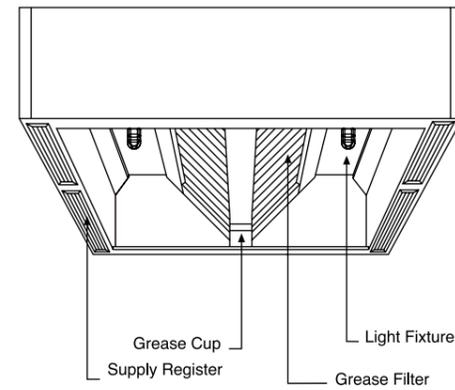
Section View



Typical Air Flow Pattern

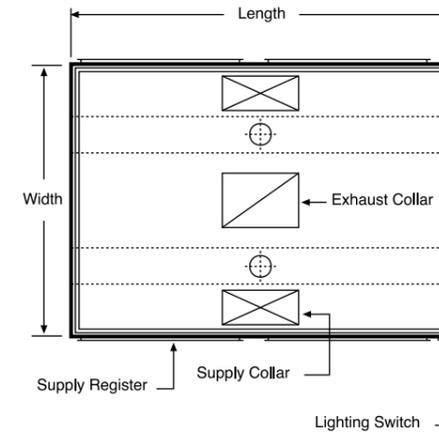


Perspective View

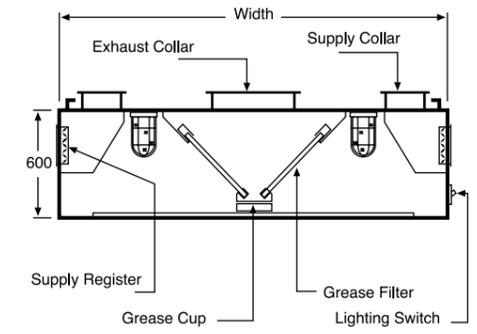


SHI - 200 SERIES: SHI - 200 C

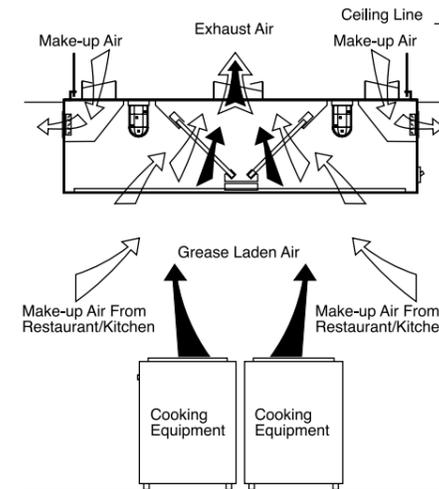
Plan View



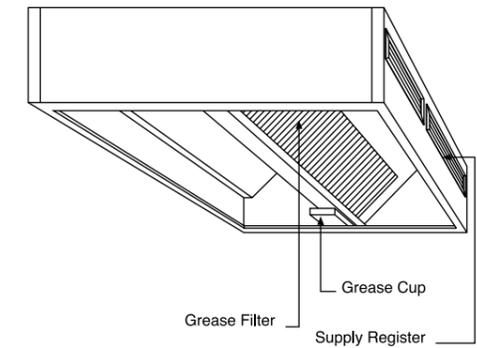
Section View



Typical Air Flow Pattern

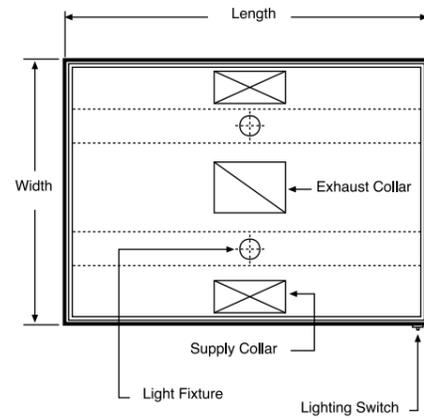


Perspective View

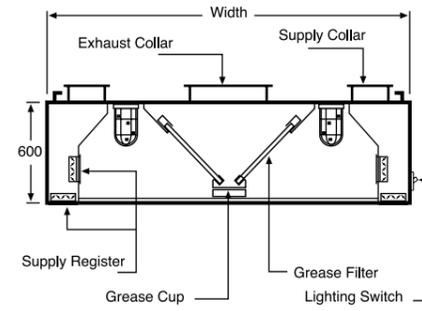


SHI - 200 SERIES: SHI - 200 AB

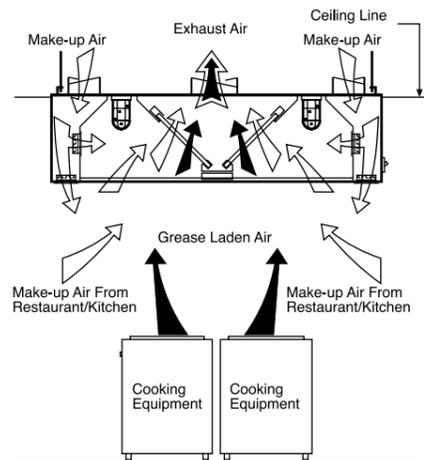
Plan View



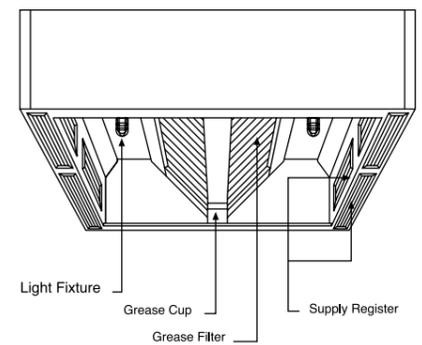
Section View



Typical Air Flow Pattern

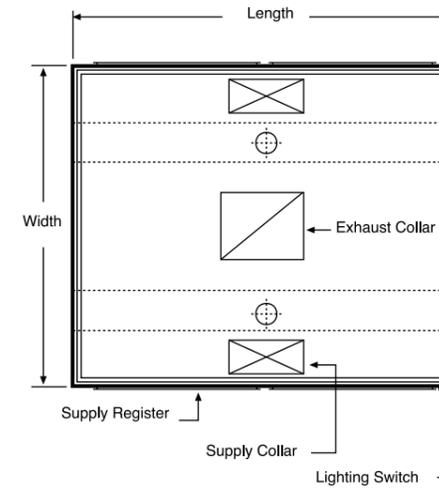


Perspective View

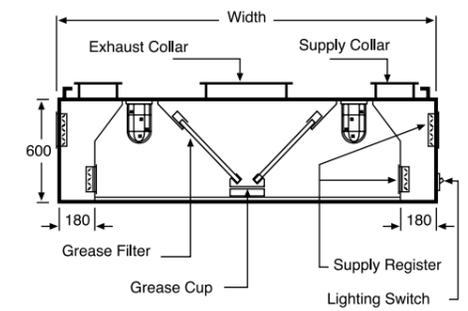


SHI - 200 SERIES: SHI - 200 AC

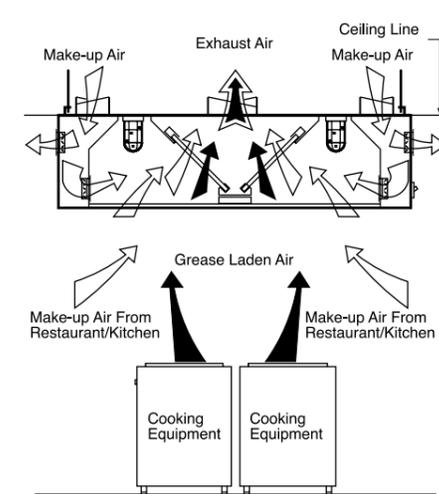
Plan View



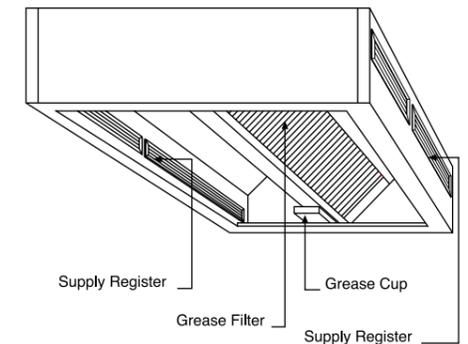
Section View



Typical Air Flow Pattern



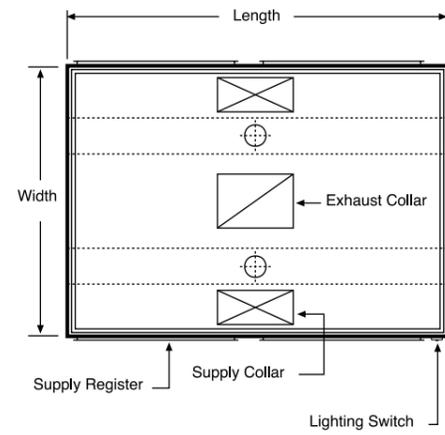
Perspective View



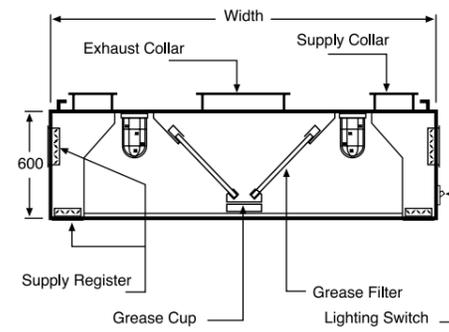
ISLAND TYPE SUPPLY AND EXHAUST COMPENSATING HOOD

SHI - 200 SERIES: SHI - 200 BC

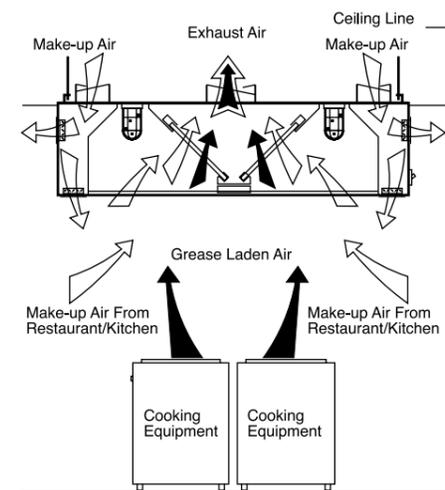
Plan View



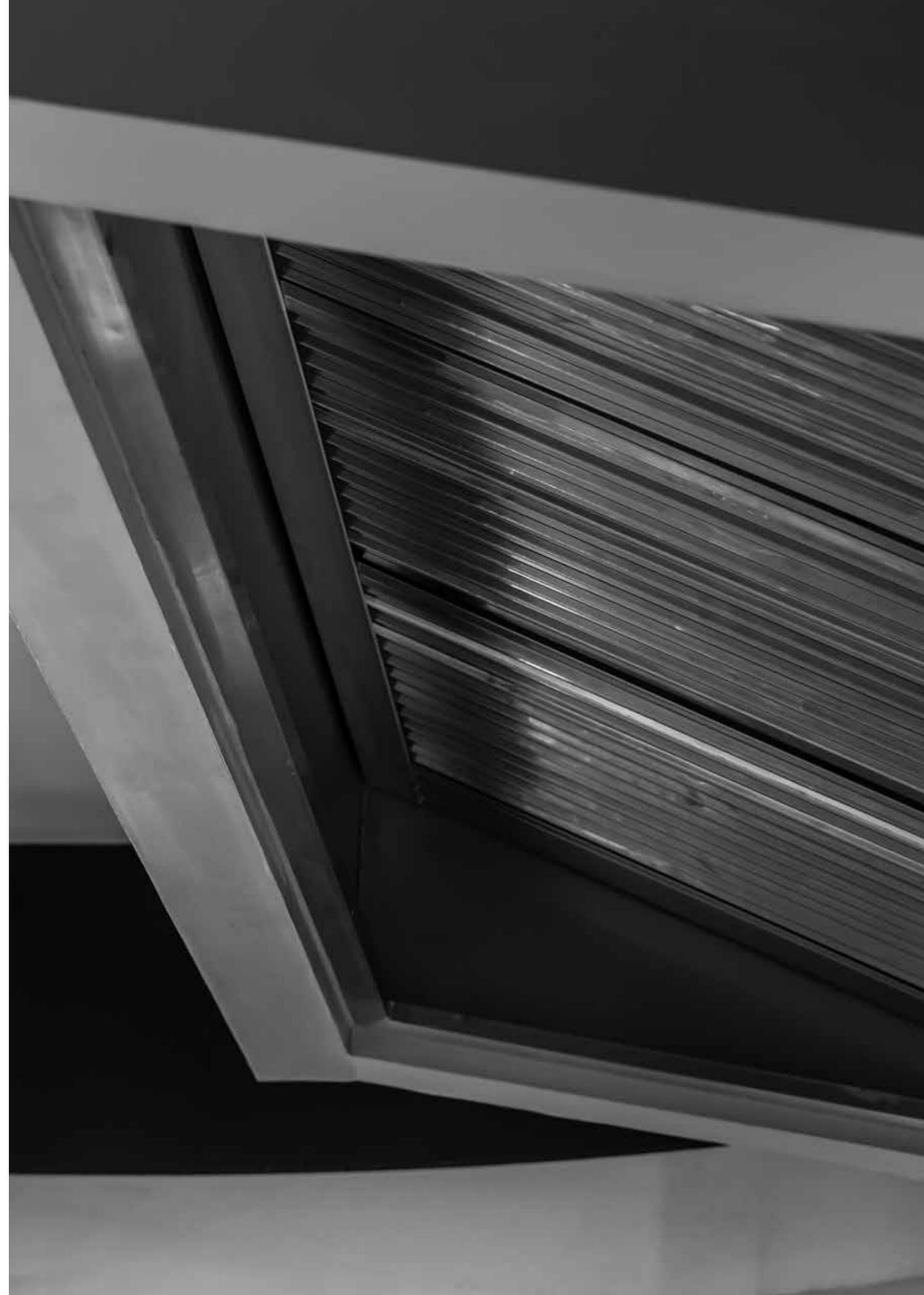
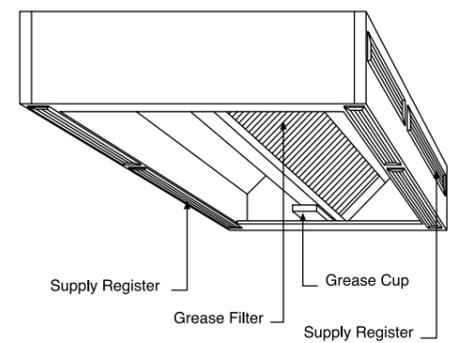
Section View



Typical Air Flow Pattern



Perspective View



OVEN HOODS





Type SHO

SAFID Hood type SHO is an exhaust only hood, designed to collect and remove heat and odors for non grease application (no make-up air through the hood).

Construction:

Hoods are constructed of 18 gauge (1.2mm thickness) stainless steel type 304 with no. 4 finish on the outer side and 2B mill finish on the inner side.

Seams are continuously welded liquidtight on the hood's lower outermost perimeter (NFPA 96) with all exposed weld to be grinded and polished to match no. 4 finish.

Dimensional Limitations:

Type SHO is available in lengths from 1000mm through 3000mm and in widths from 650mm to 1100 as a single section.

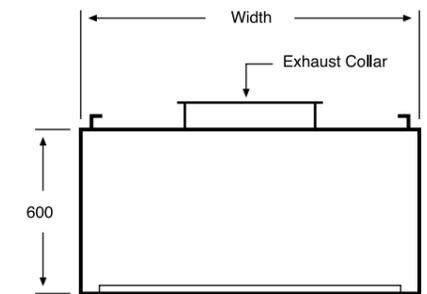
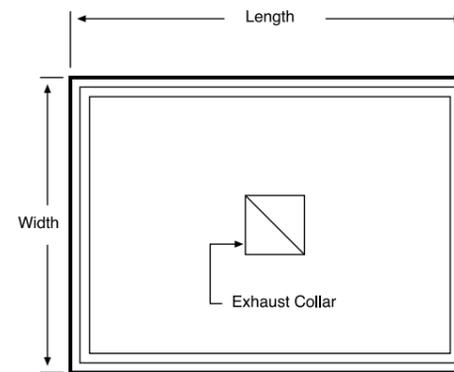
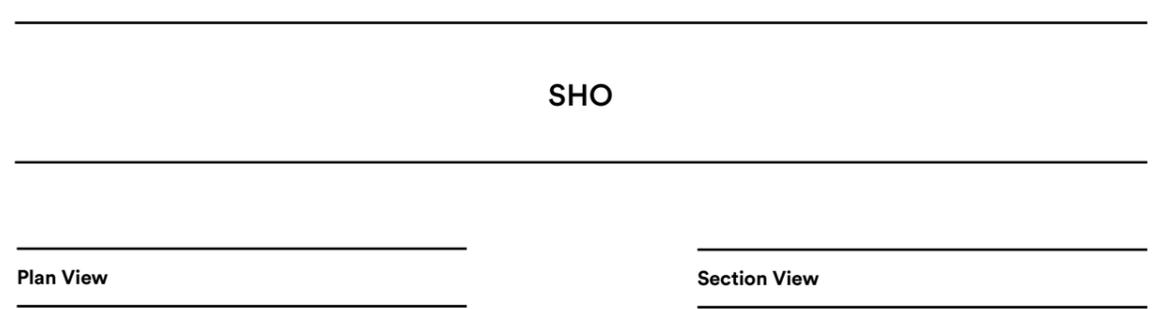
Standard Height:

600 mm

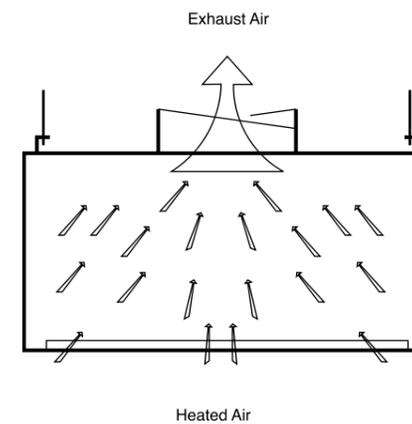
Height Range:

From 400mm to 800mm can be supplied upon request.

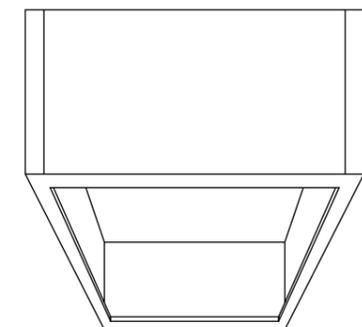
For greater lengths, hoods in multiple sections to be joined on site by bolts and nuts.



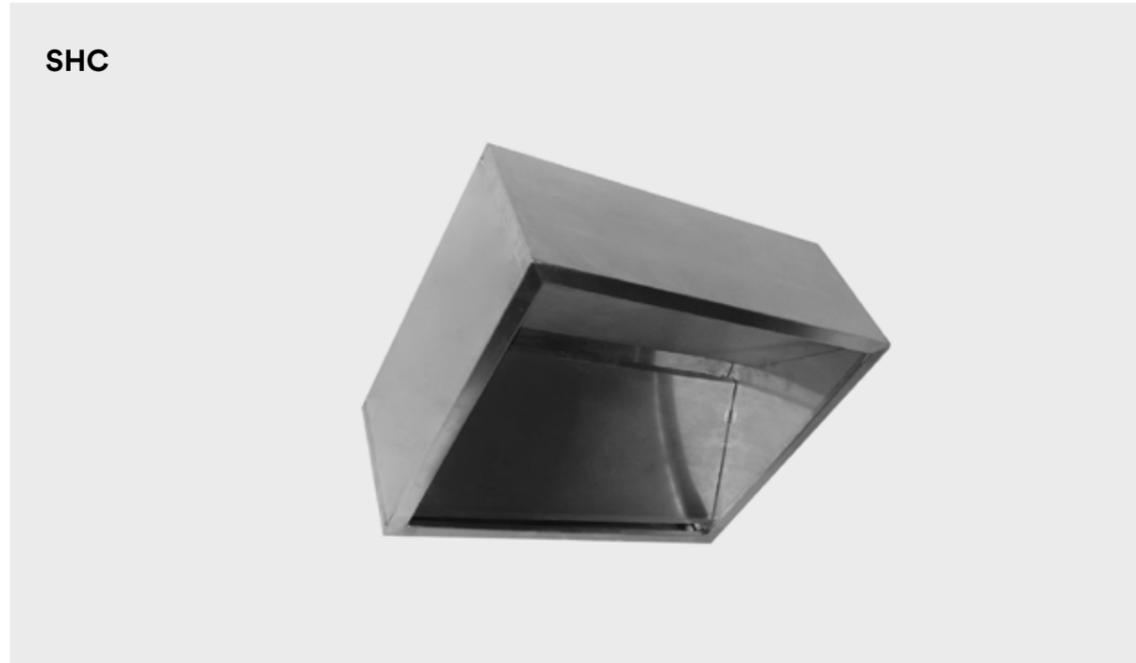
Typical Air Flow Pattern



Perspective View



CONDENSATE HOODS



Type SHC

SAFID Hood type SHC is an exhaust only hood is designed for removal of moisture laden air in non grease application (no make-up air through the hood).

Construction:

Hoods are constructed of 18 gauge (1.2mm thickness) stainless steel type 304 with no. 4 finish. All unexposed surfaces are to be of gauge 22 (0.8mm thickness) stainless steel type 304, 2B mill finish.

Seams are continuously welded liquidtight on the hood's lower outermost perimeter (NFPA 96) with all exposed weld to be grinded and polished to match no. 4 finish.

Dimensional Limitations:

Type SHC is available in lengths from 1000mm through 3000mm and in widths from 650mm to 1100 as a single section.

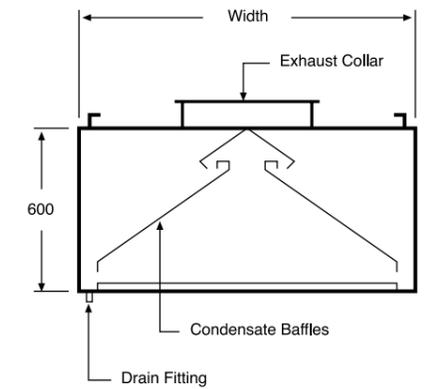
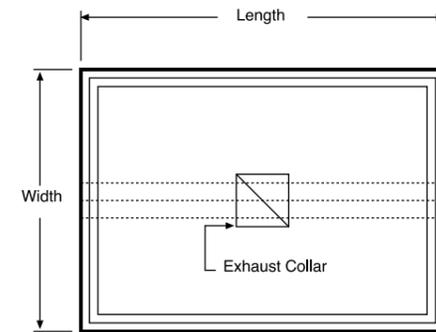
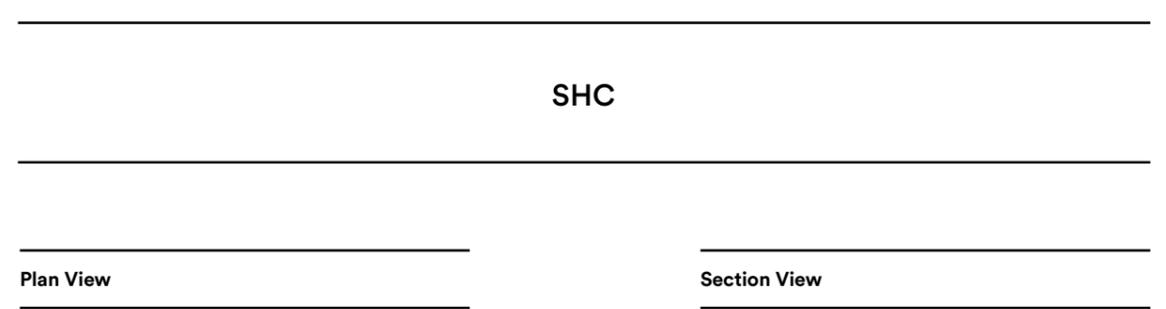
Standard Height:

600 mm

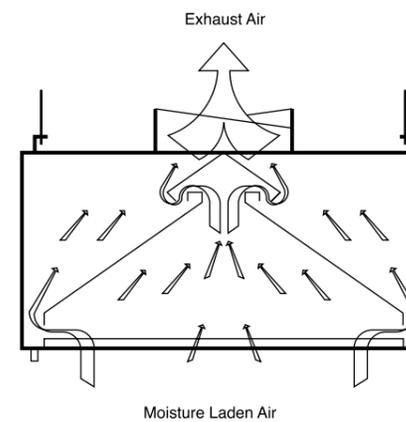
Height Range:

From 400mm to 800mm can be supplied upon request.

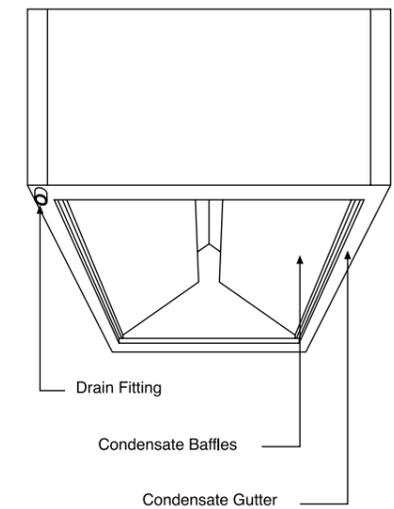
For greater lengths, hoods in multiple sections to be joined on site by bolts and nuts.



Typical Air Flow Pattern



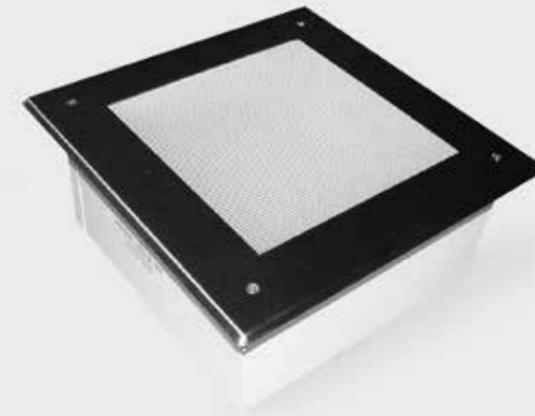
Perspective View



HOOD ACCESSORIES



RECESSED INCANDESCENT LIGHT FIXTURE



Specifications

Socket:

Side mounted porcelain medium base.

Wattage:

Accepts standard 150 watt A 23 bulb (not furnished).

Voltage:

Rated up to 120 volts.

Diffuser:

Crystal 73 tempered prismatic glass with prisma on inside of fixture.

Faceplate:

One piece, stainless steel with smooth satin finish.

Lockup:

(4) captive stainless steel screws.

Retainer:

Twin spring and cable for faceplate and frame.

Reflector:

Die formed aluminum with satin finish.

Wiring:

Connections to socket are made in the interior removable thermal insulated wiring chamber.

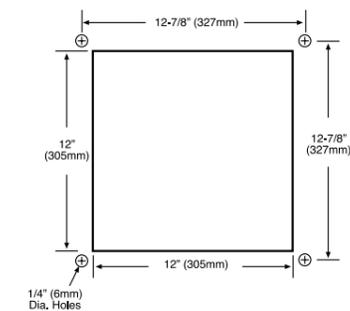
Body:

Steel recessed housing with baked white enamel finish.

Mounting:

(4) #10-24 x 3/4" (20mm) long threaded studs.

Cut-Out Mounting Diagram



Recessed Incandescent Canopy Hood Light Fixture Model No. NSF-87-TG-2

- U.L Listed and C.S.A. Certified for use in commercial cooking hoods.
- Meets all requirements for N.F.P.A. & N.E.C. 410.
- N.S.F. Component listing.
- Satin finished stainless steel faceplate to match hood interiors.
- Tempered, prismatic glass diffuser.



Surface Mount Incandescent Light Fixture



Surface Mount Canopy Lighting Fixture

U.L. Model No.	CSA Model No.	Description
L50 - 1004**	L50 - 1004 - CSA	Furnished with plastic coated* thermal and shock resistant tempered glass globe.
L50 - 1024	L50 - 1024 - CSA	Furnished with plastic coated* thermal and shock resistant tempered glass globe and glass wire guard.

Note: ** Indicates N.S.F. Listed Model.



L50 Series Lighting Fixture Replacement Parts

Ref.	Desc.	Model No.
A	Adapter Plate	L50 - X009
B	Lamp Housing Assembly Complete with Porcelain Socket & required Silicone Gaskets	L50 - Y010
C	Silicone Gasket, Outer	L50 - X004
D	Silicone Gasket, Inner	L50 - X003
E	Lamp Housing	L50 - X001
F	Porcelain Socket	L50 - X002
G	Globe, Tempered Glass Thermal & Shock Resistant Plastic Coated	L50 - X011
H	Wire Gard	L10 - X020



Surface Mount Canopy Lighting Fixtures For Commercial Cooking Hoods

Specifications

Fixture Body: Die cast aluminum with brushed finish.

Socket: Porcelain body with copper shell.

Wire Leads: 14 AWG, 6" (150mm) long.

Ground Lead: 6" (150mm) long green colored AWG wire.

Wattage: Accepts standard 100 watt A 19 bulb (not furnished).

Voltage: Rated up to 120 volts.

Gasket: Silicone

Globe: Plastic coated*, thermal and shock resistant tempered glass.

Wire Guard: Plated Steel

Overall Size: 5-1/2" (140mm) diameter 8-3/4" (220mm) long with wire guard

Junction Box: Not furnished. Fixture is designed to accept any standard 3-1/2" (90mm) or 4" (100mm) junction box.

- U.L Listed and C.S.A. Certified for use in commercial cooking hoods.
- Meets all requirements for N.F.P.A. & N.E.C. 410
- Designed for convenient installation to prewired hoods.
- Greaseproof, waterproof and heatproof construction.
- Aluminum fixtures are furnished with a brushed finish to match stainless steel hood interiors.

NOTE

*Plastic coated globes provided with "TUFF-SKIN" coating, which eliminates hot spot browning/discoloration of the globe - prevents glass shatter from impact, dropping, unusual stresses and thermal shock. It is scratch-resistant, USDA approved and improves light sources by providing better diffusion.

Underwriters Laboratories (UL) Standard 1571, requires fixtures in commercial cooking hoods to be mounted a minimum of 4 feet (1200mm) above the cooking surface.

BAFFLE TYPE GREASE FILTER



Operation

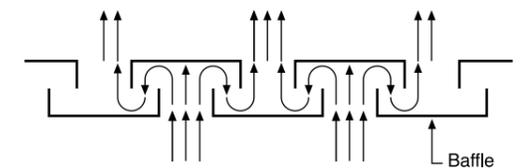
Grease laden air is drawn into the baffle filter by exhaust fan. As the air passes through the aerodynamically designed interlocking u-shape baffles, the air velocity and air pressure increases while changing its direction of 180 degrees two times. The grease is then separated in the airstream and settles on the inner surface of the baffles, leaving the exiting air with a lower amount of contaminants. The grease slides down quickly on the baffles and run off into a grease trough and then to the removable collection cup.

Fire Barrier

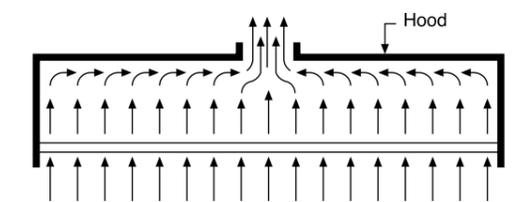
Compared to mesh type filter, in the event of flash fire on the surface of cooking equipment, the interlocking baffles provide a fire barrier. A mesh type filter where grease is deposited simultaneously on the front face, represent a significant fire hazard. Any flare-up on the surface of cooking equipment will easily ignite the grease deposited on the mesh type filter and may cause a fire inside the hood and inside the connecting ducts. There is no any U.L. listed mesh type filter and is not acceptable to use for commercial cooking operations due to the increased fire hazard.

Self - Balancing

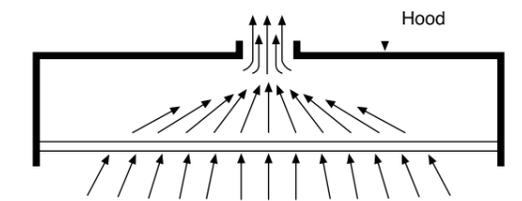
The baffle type filter is aerodynamically designed to provide a self-balancing airflow throughout the entire length of the hood.



Grease Separation at 180 ° Airflow Direction

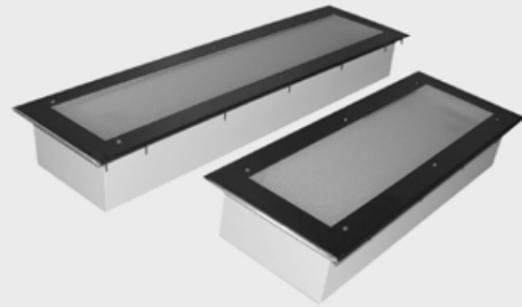


Self Balancing Airflow Through Baffle Type Grease Filter



Airflow through Mesh Type Filter

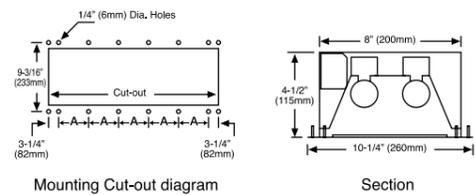
RECESSED FLUORESCENT LIGHT FIXTURE



Recessed Fluorescent Low Profile Canopy Hood Light Fixtures



- N.S.F. listed, U.L. listed and C.S.A. Certified for use in commercial cooking hoods.
- Meets all requirements for N.F.P.A. & N.E.C. 410.
- Only 4-1/2" (115mm) high... for limited overhead clearance applications.
- Tempered, prismatic glass diffuser with one piece satin finished stainless steel face frame to match hood interiors.



L50 Series Lighting Fixture Replacement Parts

Model No.	Lamps Required	Overall Trim Size	Cut-out Size	Holes Req'd	"A" Dim.
NSF - 8220 - TS - 2	(2) F20T12TS	10-1/4" x 26-1/4"	8-1/2" x 24-1/2"	12	6"
*NSF - 8220 - M	(2) F17T8	(260 x 660 mm)	(215 x 620 mm)		(150 mm)
NSF - 8230 - RS - 2	(2) F30T12RS	10-1/4" x 38-1/4"	8-1/2" x 36-1/2"	14	7-1/2"
*NSF - 8230 - M	(2) F25T8	(260 x 970 mm)	(215 x 930 mm)		(190 mm)
NSF - 8240 - RS - 2	(2) F40T12RS	10-1/4" x 50-1/4"	8-1/2" x 48-1/2"	14	10-1/2"
*NSF - 8240 - M	(2) F32T8	(260 x 1270 mm)	(215 x 1230 mm)		(235 mm)

NOTE: *Note: T8 Electronic octron ballast Available upon request
 *All models listed with -M suffix are furnished with 220V, 50 cycle ballast

Specifications

Ballast: Standard 120 volts, 60 cycle, high power factor, class P, U.L. listed. (220 volts, 50 cycle models are available as listed with -M suffix)

Lamps: T12 Fluorescent lamps (not furnished).

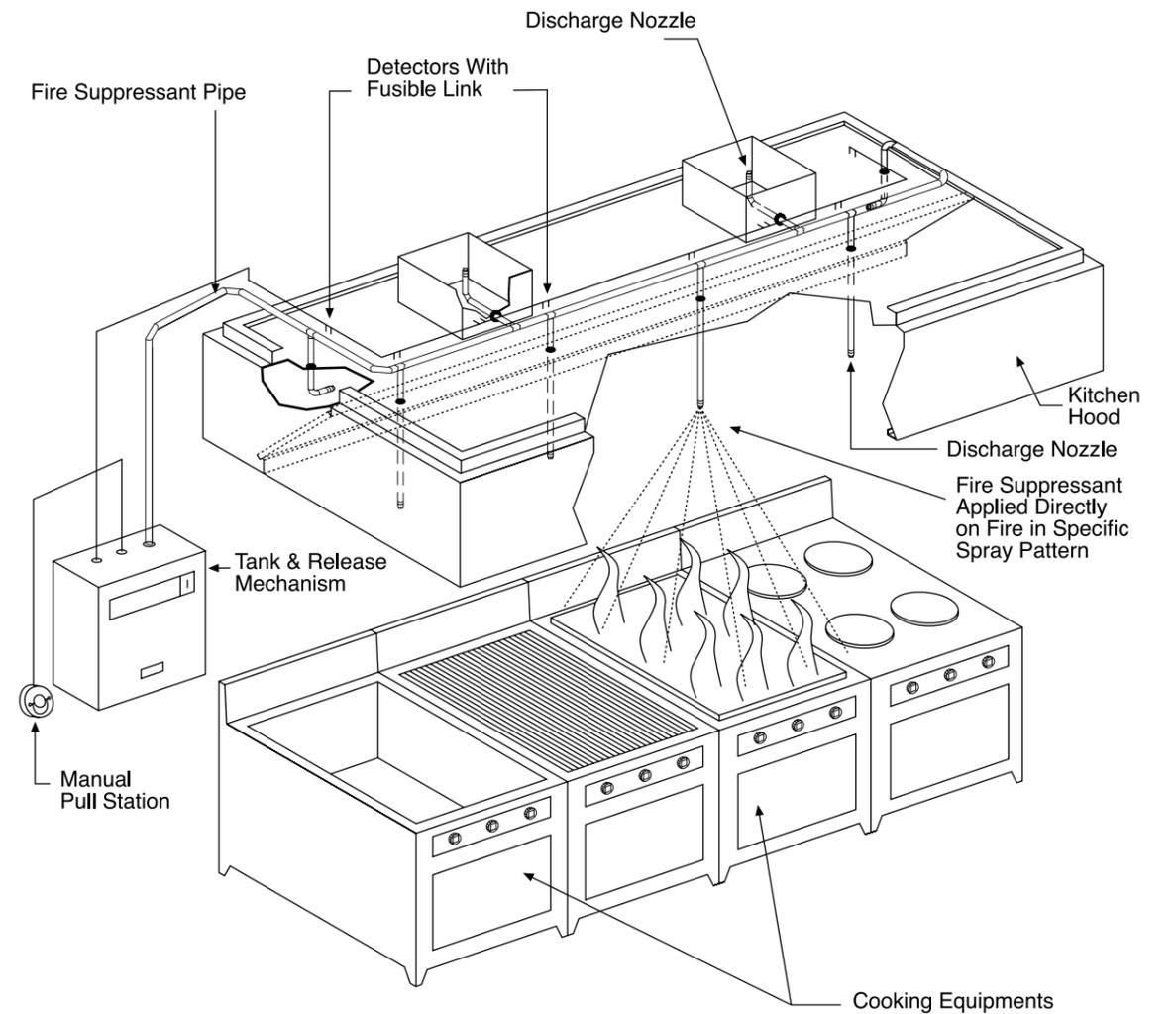
Diffuser: Crystal 73 tempered prismatic glass with prisms on inside of fixture, mounted in to a stainless steel face frame with special sealing gasketing. Secured to fixture body with stainless steel screws for easy servicing.

Reflector: Baked with white enamel finish, providing a minimum of 87% diffused reflection.

Body: Steel with a baked white enamel finish.

Mounting: #10-24 x 3/4" (20mm) long threaded studs.

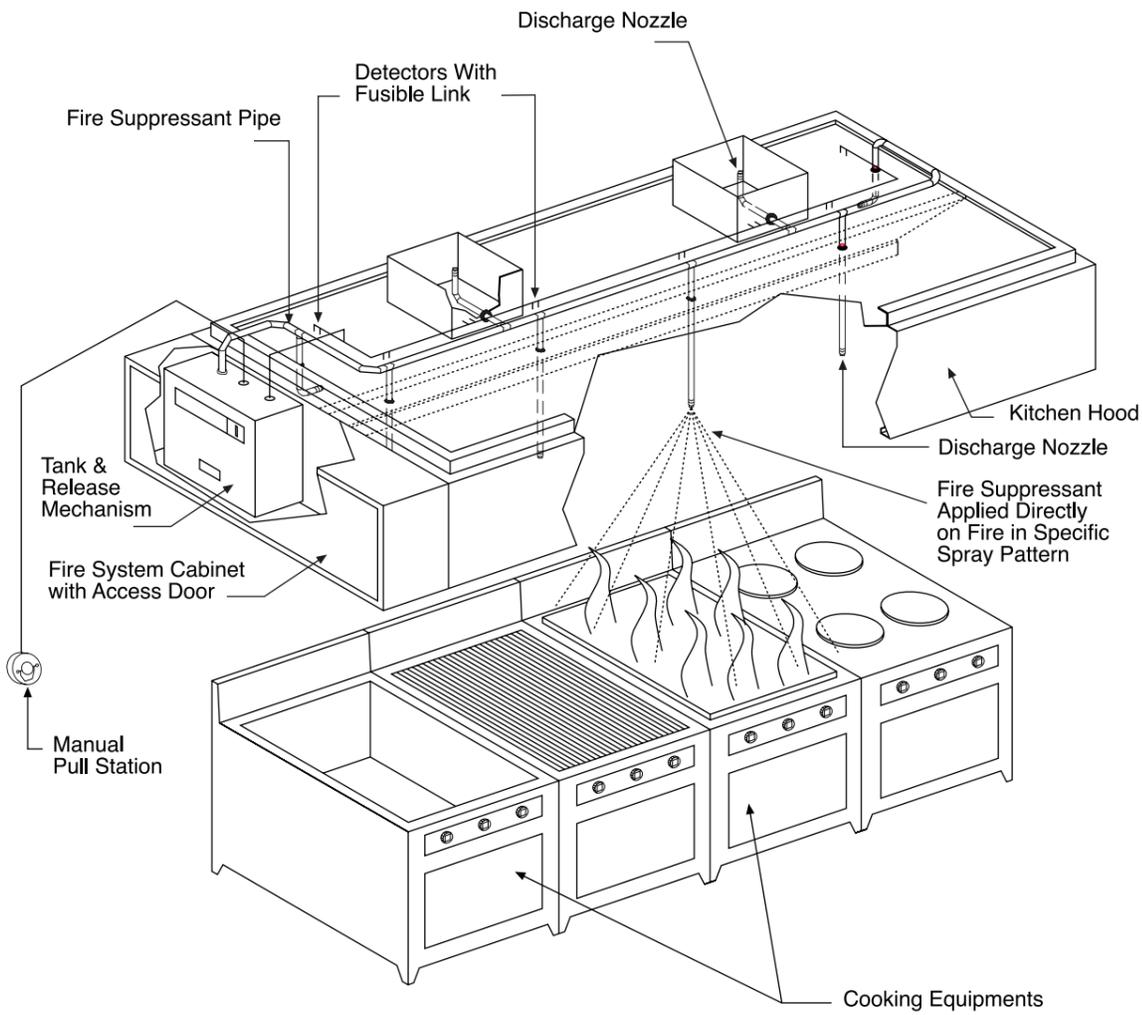
Hood with Tank and Release Mechanism: Wall Mounted



NOTE

For Factory Pre-Pipes Hoods for Fire Suppression System, please consult SAFID.

Hood with Tank and Release Mechanism: Mounted within Optional Cabinet

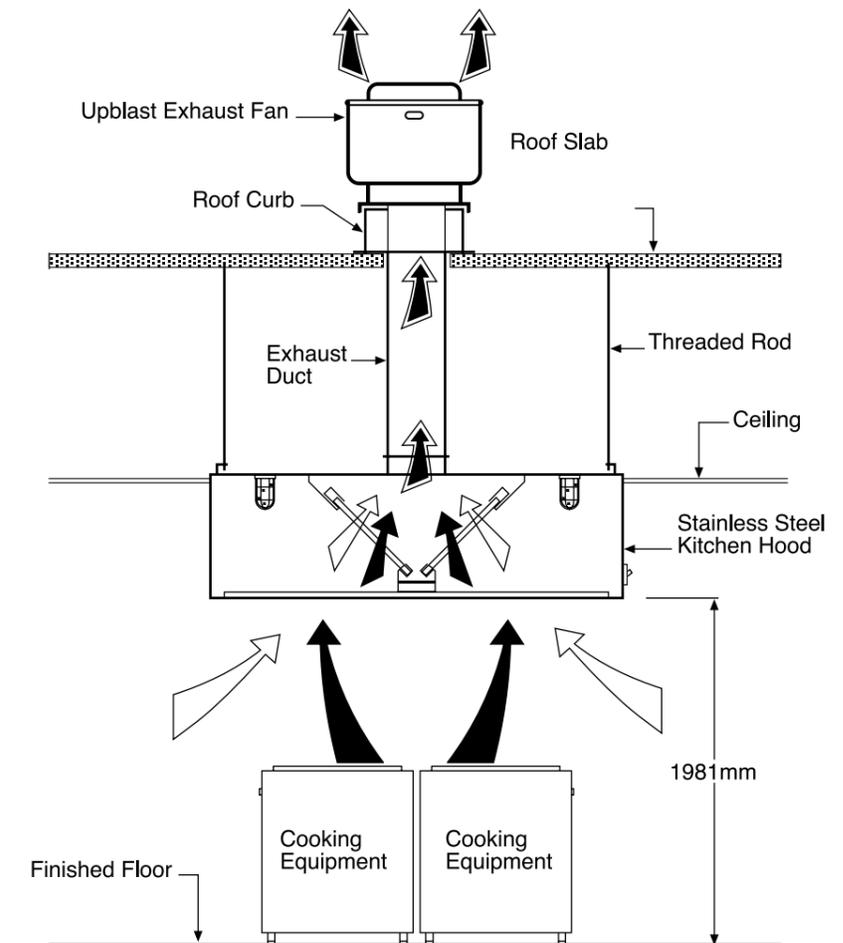


NOTE

For Factory Pre-Pipes Hoods for Fire Suppression System, please consult SAFID.

ISLAND TYPE EXHAUST HOOD - SHI - 100

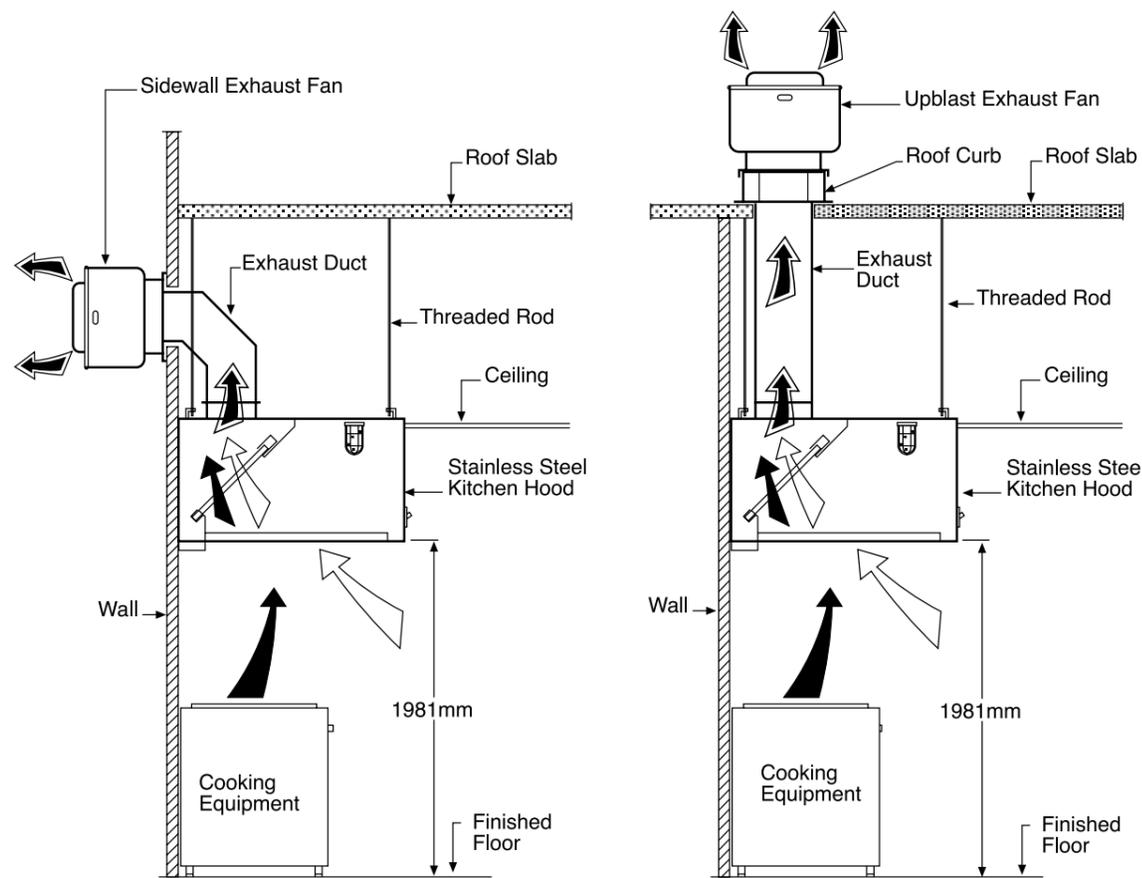
Typical Site Installation: With Upblast Exhaust Fan



Typical Installation with Upblast Exhaust Fan

WALL TYPE EXHAUST HOOD - SHW - 100

Typical Site Installation: With Sidewall or Upblast Exhaust Fan

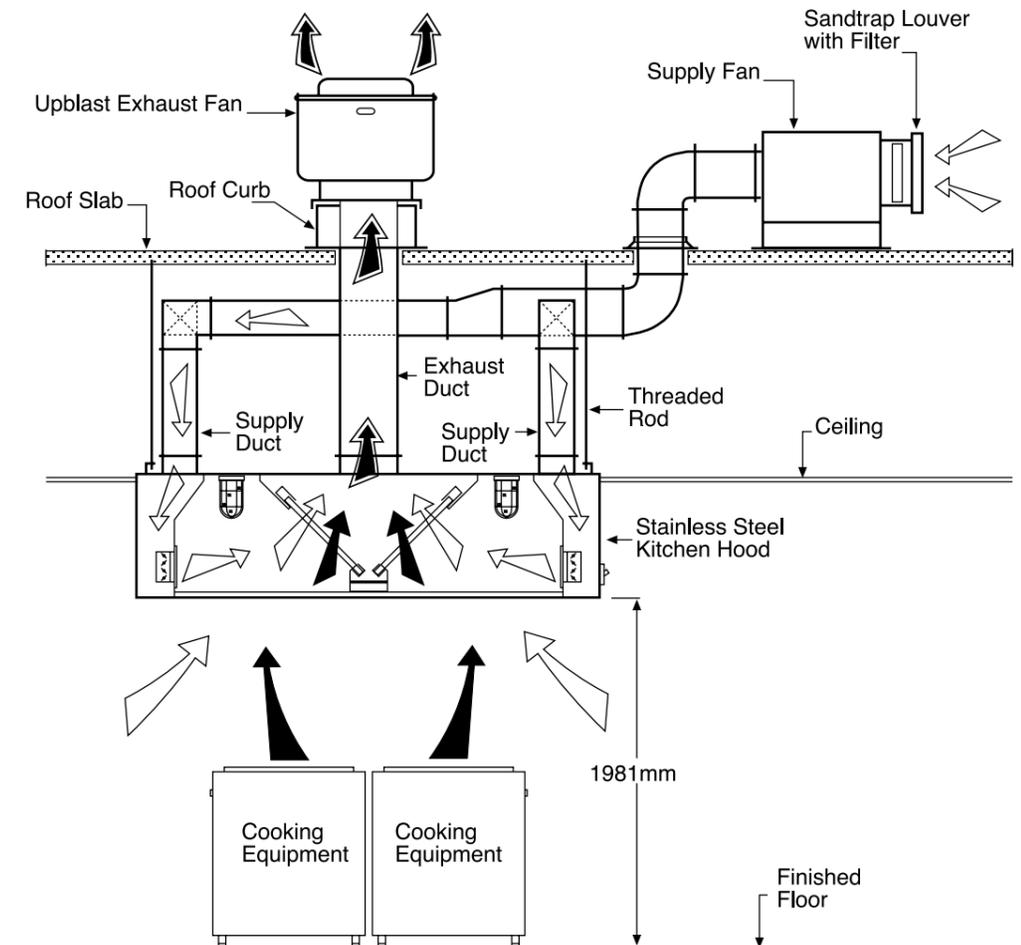


Typical Installation with Sidewall Exhaust Fan

Typical Installation with Upblast Exhaust Fan

WALL TYPE EXHAUST HOOD - SHI - 200 A

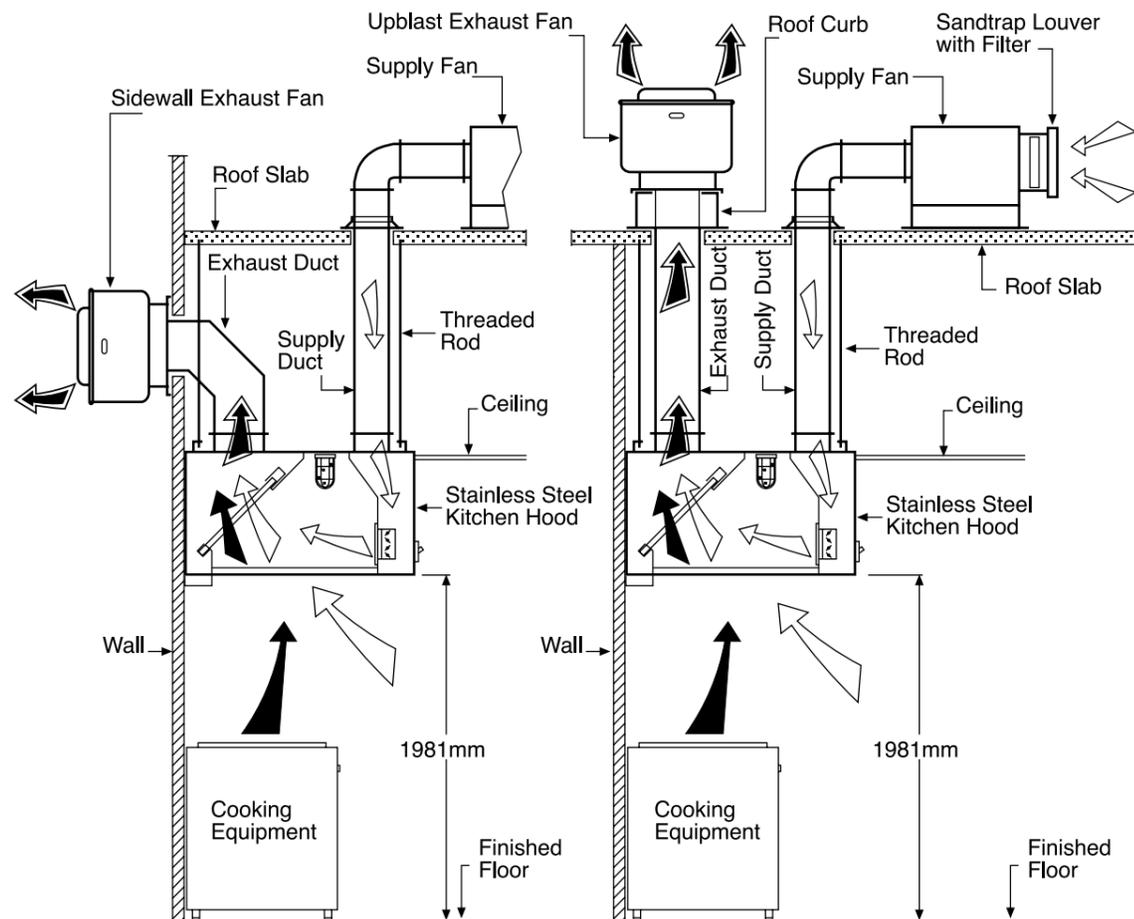
Typical Site Installation: With Upblast Exhaust Fan and Supply Fan



Typical Installation with Upblast Exhaust Fan & Supply Fan

WALL TYPE COMPENSATING HOOD - SHW - 200 A

Typical Site Installation: With Upblast Exhaust Fan and Supply Fan



Typical Installation with Sidewall Exhaust Fan & Supply Fan

Typical Installation with Upblast Exhaust Fan & Supply Fan



Construction

1. Hoods
Hoods shall be constructed of 18 gauge (1.2mm thk.) stainless steel type 304 no. 4 finish or any requested finish if available in stock. All unexposed surfaces are to be of gauge 22 (0.8mm thk.) stainless steel type 304, 2B mill finish. Hoods shall include a filter housing constructed of the same material as the hood. The filter housing shall terminate grease in a pitched full length grease trough, which shall drain into a removable grease cup.

Compensating hoods being either wall or island type shall have air supplied (make-up air) through supply registers which provide easy adjustable air control and effective air deflection. The make-up air coming through the register first passes through a supply air plenum. The supply air plenum can be insulated with 25mm thk. fiberglass thermal insulation as an option. For more information, see typical hood details.

2. Electrical System
The hoods will be supplied with U.L. listed vaporproof incandescent light fixture; prewired to a junction box mounted on the top of the hood.

3. Dimensional Limitations
Hoods can be supplied in any required size built of multiple sections if the size exceed the dimensional limitations as specified on every type of hood. Heights can be supplied in ranges from 400 up to 800mm.

4. Accessories
A. Covering Board
Covering boards are available for covering the space between the top edge of the hood and the ceiling. The covering boards are manufactured of the same material and finish as the hood.

B. Fire Dampers
Hoods to be equipped with fire damper built of stainless steel and activated by a fusible link. The fire damper blades is to be of spring loaded and curtain type. Fire dampers to be installed at the hood collars for both supply air and exhaust air side.

C. Access Doors
When fire dampers are used in supply or exhaust side, an access door is recommended for every fire damper. The access door shall be installed on the supply and exhaust duct for cleaning, inspection and for reloading when whenever the fusible link has been defused.

D. Special Finishes
Hoods can be supplied with special finishes, i.e., epoxy coated galvanized steel, or aluminum construction. Standard material used is stainless steel type 304 no. 4 finish.

Accessories

Lights

Hoods will be supplied with UL listed vaporproof incandescent light fixtures prewired to a junction box mounted on top of the hood for field connection to power supply.

Grease Filters

All filters to be of baffle type construction of stainless steel type 304, no. 4 finish, supplied with fold down handles for easy removing and cleaning. Filter drain all grease into a full length grease trough made of stainless steel pitched to drain grease from filter and exhaust plenum into a removable grease cup.

Fire Suppression System

SAFID can supply hoods with holes predrilled in the Factory ready to have pipes for the fire suppression systems alongwith fire system cabinet fixed to hoods constructed with the same material of hood.

SAFID can coordinate with ANSUL representative or with other fire suppression system supplier for a factory prepiped hood and a complete fire suppression protection package

Perforated Face Supply

SAFID hoods type SHW 200 series and SHI 200 series can be supplied with perforated face panel constructed of stainless steel type 304 in lieu of the register.

The perforated face panel provide a uniform distribution of air with reduced velocities.

Optional Construction

Hood Construction (Optional)

Hoods can be supplied in galvanized steel, painted steel or black steel in lieu of standard stainless steel, and in 16 gauge in lieu of standard 18 gauge stainless steel.

Covering Board (Optional)

Covering boards are available for covering the space between the top edge of the hood and the ceiling. The covering boards are manufactured of the same material and finish as the hood.

Grease Filters (Optional)

Filters can be supplied in aluminum or galvanized steel sheet.

Light Fixtures (Optional)

Flourescent light fixtures prewired and fixed to hood.

Supply Plenum (Optional)

SAFID to insulate all internal side of air supply plenums with 25mm thickness thermal insulation, 48 kg/m³ with foil reinforced kraft (FRK) facing to eliminate condensation due to tempered supply air or due to surrounding air.

Fire Damper (Optional)

Hoods can be equipped with fire dampers built of stainless steel and activated by a fusible link. The fire damper blades is to be of spring loaded and curtain type. Fire dampers to be installed at the hood collars for both the supply air and exhaust air side.

Access Door (Optional)

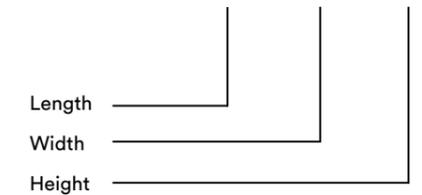
When fire dampers are used in supply air and exhaust air side, an access door is recommended for every fire damper. The access door shall be installed on the supply and exhaust duct for cleaning, inspection and for reloading whenever the fusible link has been defused.

Order Details

Order Code: SHW - 100 / 2400 x 1100 x 600

Variants:

- SHW = SAFID Hood, Wall Type
- SHI = SAFID Hood, Island Type
- SHO = SAFID Hood, Oven Hood
- SHC = SAFID Hood, Condensate Hood
- 100 = Exhaust Only
- 200A = Compensating Hood with Internal Discharge
- 200B = Compensating Hood with Downward Discharge
- 200C = Compensating Hood with Front Face Discharge
- 200AB = Compensating Hood with Internal and Downward Discharge
- 200AC = Compensating Hood with Internal and Front Face Discharge
- 200BC = Compensating Hood with Downward and Front Face Discharge



Order Example

1. **Make:** SAFID
Code: SHW - 100 / 2400 X 1100 X 600
Qty: 1 pc
2. **Make:** SAFID
Code: SHW - 200A / 2400 X 1100 X 600
Qty: 1 pc
3. **Make:** SAFID
Code: SHI - 100 / 2400 X 1250 X 600
Qty: 1 pc
4. **Make:** SAFID
Code: SHI - 200A / 2400 X 1650 X 600
Qty: 1 pc

HOOD WEIGHTING

Weights of Hood

Weight of Hood for 600 mm Standard Height (kg/meter)

Type of Hood	Width of Hood (mm)					
	1100	1150	1250	1650	2000	2400
Wall Type Exhaust Hood Model: SHW - 100	125					
Wall Type Compensating Hood Model: SHW - 200 Series	141		149			
Island Type Exhaust Hood Model: SHI - 100			181	202	228	
Island Type Compensating Hood Model: SHI - 200 Series				241	264	291

