KITCHEN HOODS.
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ENGINEERING & DESIGN GUIDE FOR KITCHEN VENTILATION
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.

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.
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
EXHAUST AIRFLOW REQUIREMENTS

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 (in square feet) 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 that can be used to determine the total quantity of rising contaminated air (Qac) for each hood. This factor is used to calculate the total quantity of air to be exhausted for the hood (Qt).

\[ Qt = Qac \times Sf \]

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

**Table 1: Convection Flow Factor (Cf)**

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

**Table 2: Safety Factor to Absorb Crossdraft (Sf)**

<table>
<thead>
<tr>
<th>Type of Hood</th>
<th>1 Side Open</th>
<th>3 Sides Open</th>
<th>4 Sides Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Type Exhaust Hood</td>
<td>1.05</td>
<td>1.25</td>
<td>-</td>
</tr>
<tr>
<td>Wall Type Compensating Hood</td>
<td>1.05</td>
<td>1.25</td>
<td>-</td>
</tr>
<tr>
<td>Wall Type Exhaust Hood</td>
<td>-</td>
<td>1.25</td>
<td>-</td>
</tr>
<tr>
<td>Wall Type Compensating Hood</td>
<td>-</td>
<td>1.25</td>
<td>-</td>
</tr>
<tr>
<td>Island Type Exhaust Hood</td>
<td>-</td>
<td>-</td>
<td>1.35</td>
</tr>
<tr>
<td>Island Type Compensating Hood</td>
<td>-</td>
<td>-</td>
<td>1.35</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Equip. NO.</th>
<th>Type of Hood</th>
<th>Surface Size</th>
<th>Area (ASC)</th>
<th>Convection Flow (Cf)</th>
<th>Contaminated Air (Qac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Toaster - Electric</td>
<td>15” x 15”</td>
<td>1.6</td>
<td>6</td>
<td>9.6</td>
</tr>
<tr>
<td>2</td>
<td>Cheese Melter - Electric</td>
<td>15” x 10”</td>
<td>1.25</td>
<td>25</td>
<td>637.5</td>
</tr>
<tr>
<td>3</td>
<td>Griddle - Electric</td>
<td>36” x 30”</td>
<td>7.5</td>
<td>85</td>
<td>637.5</td>
</tr>
<tr>
<td>4</td>
<td>Charbroiler - Gas</td>
<td>32” x 24”</td>
<td>7.6</td>
<td>150</td>
<td>1500</td>
</tr>
<tr>
<td>5</td>
<td>Convection Oven - Electric</td>
<td>34” x 34”</td>
<td>8</td>
<td>59</td>
<td>472</td>
</tr>
<tr>
<td>6</td>
<td>Fryer - Electric</td>
<td>11” x 24”</td>
<td>4</td>
<td>85</td>
<td>340</td>
</tr>
<tr>
<td>7</td>
<td>Open Top Range - Electric</td>
<td>32” x 29”</td>
<td>6.4</td>
<td>50</td>
<td>320</td>
</tr>
</tbody>
</table>

\[ Qt = Qac \times Sf \]

\[ Qt = 3324.1 \times 1.35 \]

\[ Qt = 4487.54 \text{ CFM} \]
EXHAUST AIRFLOW REQUIREMENTS

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.

**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.

<table>
<thead>
<tr>
<th>Equip. NO.</th>
<th>Type of Hood</th>
<th>Surface Size</th>
<th>Area (ASC)</th>
<th>Convection Flow (Cf)</th>
<th>Contaminated Air (Qca)</th>
<th>Total: Qt = Qac x Sf</th>
<th>Qt = 2669 x 1.25</th>
<th>Qt = 3336.25 CFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Griddle - Electric</td>
<td>24” x 30”</td>
<td>5</td>
<td>85</td>
<td>425</td>
<td>2669</td>
<td>365</td>
<td>425</td>
</tr>
<tr>
<td>2</td>
<td>Open Top Range - Electric</td>
<td>35” x 30”</td>
<td>7.3</td>
<td>50</td>
<td>365</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Charbroiler - Gas</td>
<td>34” x 30”</td>
<td>71</td>
<td>200</td>
<td>1420</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Deep Fat Fryer - Electric</td>
<td>26” x 30”</td>
<td>5.4</td>
<td>85</td>
<td>459</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 2669

\[ Qt = Qac \times Sf \]

\[ Qt = 2669 \times 1.25 \]

\[ Qt = 3336.25 \text{ CFM} \]

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
SELECTION OF GREASE FILTERS

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.

Table 3: Baffle Type Grease Filter

<table>
<thead>
<tr>
<th>Flow Rate</th>
<th>Filter Nominal Size and Static Pressure Loss (in W.G.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM/Filter</td>
<td>10&quot; x 20&quot;</td>
</tr>
<tr>
<td>200</td>
<td>0.25</td>
</tr>
<tr>
<td>225</td>
<td>0.31</td>
</tr>
<tr>
<td>250</td>
<td>0.38</td>
</tr>
<tr>
<td>275</td>
<td>0.46</td>
</tr>
<tr>
<td>300</td>
<td>0.55</td>
</tr>
<tr>
<td>325</td>
<td>0.63</td>
</tr>
<tr>
<td>350</td>
<td>0.72</td>
</tr>
<tr>
<td>375</td>
<td>0.81</td>
</tr>
<tr>
<td>400</td>
<td>0.91</td>
</tr>
<tr>
<td>425</td>
<td>1.06</td>
</tr>
<tr>
<td>450</td>
<td>1.17</td>
</tr>
<tr>
<td>475</td>
<td>1.32</td>
</tr>
<tr>
<td>500</td>
<td>1.45</td>
</tr>
<tr>
<td>525</td>
<td>1.61</td>
</tr>
<tr>
<td>550</td>
<td>1.75</td>
</tr>
<tr>
<td>575</td>
<td>1.91</td>
</tr>
<tr>
<td>600</td>
<td>2.08</td>
</tr>
<tr>
<td>625</td>
<td>2.27</td>
</tr>
<tr>
<td>650</td>
<td>2.47</td>
</tr>
<tr>
<td>675</td>
<td>2.68</td>
</tr>
<tr>
<td>700</td>
<td>2.90</td>
</tr>
<tr>
<td>725</td>
<td>3.13</td>
</tr>
<tr>
<td>750</td>
<td>3.37</td>
</tr>
<tr>
<td>775</td>
<td>3.62</td>
</tr>
<tr>
<td>800</td>
<td>3.88</td>
</tr>
<tr>
<td>825</td>
<td>4.17</td>
</tr>
<tr>
<td>850</td>
<td>4.48</td>
</tr>
<tr>
<td>875</td>
<td>4.81</td>
</tr>
<tr>
<td>900</td>
<td>5.15</td>
</tr>
<tr>
<td>925</td>
<td>5.51</td>
</tr>
</tbody>
</table>

Table 4: Baffle Type Grease Filter

<table>
<thead>
<tr>
<th>Nominal Size (HxW)</th>
<th>10&quot; x 20&quot;</th>
<th>12&quot; x 20&quot;</th>
<th>16&quot; x 16&quot;</th>
<th>16&quot; x 20&quot;</th>
<th>16&quot; x 25&quot;</th>
<th>20&quot; x 20&quot;</th>
<th>20&quot; x 25&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Rate</td>
<td>1000 CFM</td>
<td>1200 CFM</td>
<td>1600 CFM</td>
<td>1800 CFM</td>
<td>2000 CFM</td>
<td>2400 CFM</td>
<td>2800 CFM</td>
</tr>
<tr>
<td>CFM/Filter</td>
<td>1000 CFM</td>
<td>1200 CFM</td>
<td>1600 CFM</td>
<td>1800 CFM</td>
<td>2000 CFM</td>
<td>2400 CFM</td>
<td>2800 CFM</td>
</tr>
</tbody>
</table>

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

Quantity of Filters = \( \frac{Q_t}{(Equation-2)} \) (Equation-3)

Where \( Q_t \) = total quantity of air to be exhausted

Total length of filter bank = \( \text{Quantity of filters} \times \text{Effective Width of filter (Table 4)} \) (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 overlap 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" - (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:

Quantity of Filters = \( \frac{Q_t1}{(Equation-2)} \) (Equation-3)

\( Q_t1 = 1668 \text{ CFM} \)

425 CFM

Quantity of Filters = 3 or 4 pcs

The preliminary length of filter bank is 66 1/2" as mentioned above. From Table 4, a nominal size of 16" x 16" 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" x 16" 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.
SELECTION OF GREASE FILTERS

DUCT SIZES AND STATIC PRESSURE LOSS

Figure 8

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.

\[ V = \frac{144Q_t}{A} \] (Equation-5)

Where:
- \( Q_t \) = 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 losses on the exhaust system associated with the following must be known:

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

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

Where:
- \( C \) = 0.5
- \( V_p \) = velocity pressure on the duct collar (in. W.G.)

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, \( V = \frac{144Q_t}{A} \). With duct air velocity of 1600 Ft/min, the cross sectional area (\( A \)) of duct will be:

\[ A = \frac{144 \times 3600 \text{ CFM}}{1600 \text{ Ft/min}} = 324 \text{ sq.in.} \]

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

\[ V_p = \frac{(1600 \times 1600)}{(4005 \times 4005)} = 0.16 \text{ in. W.G.} \]

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

\[ = (0.5 \times 0.16) + 0.75 + 0.1 \]

\[ = 0.93 \text{ in. W.G.} \]

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 0.019" W.G./100ft or 0.0019" W.G./ft.

Duct loss = 5ft x 0.0019" W.G./ft
\[ = 0.0095 \text{ in. W.G.} \]

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

5. Total Static Pressure = 0.93 + 0.0095 + 0.15
\[ = 1.09 \text{ in. W.G.} \]

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 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


WALL TYPE EXHAUST HOOD
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.
COMPENSATING HOOD WALL TYPE
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 liquid tight 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 vapor proof 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.
WALL TYPE COMPENSATING HOOD

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
COMPENSATING HOOD WALL TYPE

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 ground 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 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.
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 ground 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 drip 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 SHI - 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.

Plan View

Section View

Typical Air Flow Pattern

Perspective View
ISLAND TYPE SUPPLY AND EXHAUST COMPENSATING HOOD

SHI - 200 SERIES: SHI - 200 B

Plan View

Typical Air Flow Pattern

Perspective View

SHI - 200 SERIES: SHI - 200 C

Plan 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 liquid tight on the hood's lower outermost perimeter (NFPA 96) with all exposed weld to be ground 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.
CONDENSATE EXHAUST HOOD

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 ground 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.
Specifications

Socket:
Side mounted porcelain medium base.

Wattage:
Accepts standard 150 watt A23 bulb (not furnished).

Voltage:
Rated up to 120 volts.

Diffuser:
Crystal tempered prismatic glass with prism 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.
VAPORPROOF LIGHT FIXTURES

Surface Mount Incandescent Light Fixture

Surface Mount Canopy Lighting Fixtures For Commercial Cooking Hoods

Specifications

- **Fixure 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 A19 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.

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.
HOOD ACCESSORIES

HOOD ACCESSORIES

VAPORPROOF LIGHT FIXTURES

HOOD ACCESSORIES

RECESSED FLUORESCENT LIGHT FIXTURE

Recessed Fluorescent Low Profile Canopy Hood Light Fixtures

- 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.

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.

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

L50 Series Lighting Fixture Replacement Parts

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lamps Required</th>
<th>Overall Trim Size</th>
<th>Cut-out Size</th>
<th>Holes Req’d</th>
<th>“A” Dim.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSF - 8220 - TS - 2</td>
<td>(2) F2T12TS</td>
<td>10-1/4&quot; x 26-1/4&quot;</td>
<td>8-1/2&quot; x 24-1/2&quot;</td>
<td>12</td>
<td>6&quot;</td>
</tr>
<tr>
<td>*NSF - 8220 -M</td>
<td>(2) F1T8</td>
<td>(260 x 660 mm)</td>
<td>(215 x 620 mm)</td>
<td>(150 mm)</td>
<td></td>
</tr>
<tr>
<td>NSF - 8225 - RS - 2</td>
<td>(2) F2T12RS</td>
<td>10-1/4&quot; x 38-1/4&quot;</td>
<td>8-1/2&quot; x 36-1/2&quot;</td>
<td>16</td>
<td>7-1/2&quot;</td>
</tr>
<tr>
<td>*NSF - 8225 - M</td>
<td>(2) F2STB</td>
<td>(260 x 970 mm)</td>
<td>(215 x 930 mm)</td>
<td>(190 mm)</td>
<td></td>
</tr>
<tr>
<td>NSF - 8240 - RS - 2</td>
<td>(2) F4T12RS</td>
<td>10-1/4&quot; x 50-1/4&quot;</td>
<td>8-1/2&quot; x 48-1/2&quot;</td>
<td>14</td>
<td>10-1/2&quot;</td>
</tr>
<tr>
<td>*NSF - 8240 - M</td>
<td>(2) F4STB</td>
<td>(260 x 1270 mm)</td>
<td>(215 x 1230 mm)</td>
<td>(235 mm)</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: *Note: T8 Electronic octron ballast Available upon request

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.

Typical Site Installation: With Upblast Exhaust Fan
INSTALLATION DETAILS

WALL TYPE EXHAUST HOOD - SHW - 100

Typical Site Installation: With Sidewall or Upblast Exhaust Fan

WALL TYPE EXHAUST HOOD - SHI - 200 A

Typical Site Installation: With Upblast Exhaust Fan and Supply Fan
TYPICAL SPECIFICATIONS

### 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 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.
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 alongside 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.

Order Example
1. Make: SAFID
   Code: SHW - 100 / 2400 X 1100 X 600
   Qty: 1 pc
2. Make: SAFID
   Code: SHW - 200A / 2400 X 1650 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

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
## HOOD WEIGHTING

### Weights of Hood

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

<table>
<thead>
<tr>
<th>Type of Hood</th>
<th>Width of Hood (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1100</td>
</tr>
<tr>
<td>Wall Type Exhaust Hood Model: SHW - 100</td>
<td>125</td>
</tr>
<tr>
<td>Wall Type Compensating Hood Model: SHW - 200 Series</td>
<td>141</td>
</tr>
<tr>
<td>Island Type Exhaust Hood Model: SHI - 100</td>
<td>181</td>
</tr>
<tr>
<td>Island Type Compensating Hood Model: SHI - 200 Series</td>
<td>241</td>
</tr>
</tbody>
</table>