

# Calculation of air volume to exhaust

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According to NFPA 96, the air volume of the exhaust hood must be sufficient to collect and exhaust the grease-laden vapours produced by the cooking appliances.

Practical guide for calculating air volume (Chart 1)

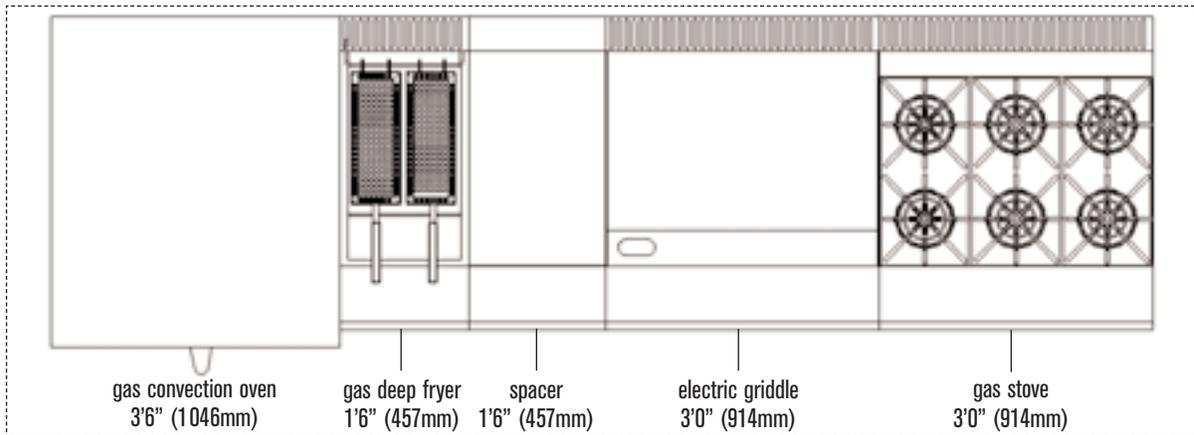
Cooking appliances	Electrical cooking appliances		Gas cooking appliances	
	CFM / linear foot	(L/s) linear metre	CFM / linear foot	(L/s) linear metre
<b>LIGHT</b>				
Convection oven, regular oven	155	240	175	270
Combination oven	180	280	205	320
Pizza oven	175	270	195	300
Food warmer, vegetable steamer, pasta cooker	145	225	160	250
Rotisserie, smoker	185	285	215	335
Tilting skillets	180	280	215	335
Salamander broiler	145	225	175	270
Spacer or non-cooking appliance	100	155	100	155
<b>MEDIUM</b>				
Countertop cooking surface	195	300	215	335
Stove	245	380	275	425
Deep fryer	235	365	265	410
Griddle	255	395	295	455
Boiling plate	275	425	325	505
Induction plate	240	375	-	-
Braising pan	205	320	230	360
<b>INTENSE</b>				
Radiant broiler	325	505	375	580
Charbroiler	365	565	425	660
Upright broiler	375	580	435	675
Wok	375	580	450	695
<b>VERY INTENSE</b>				
Infrared broiler	445	690	495	765
Chain broiler, Lava rock charbroiler	455	705	505	785
Wok	375	580	450	695

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Here is a combination of cooking appliances to illustrate an example of air volume calculations

### Wall type hood 13'-6" x 4'-6" (4,112mm x 1,371mm)



**Details:**

- Hood: 13'-6" (4,112mm) long x 4'-6" (1,371mm) wide
- Wall-mounted hood
- Hood installation height 6'-6" (1,980mm) from floor
- Clearance (overhang): 6" (152mm) on each side and 12" (304mm) at the front between the cooking appliances and the hood

**Example:**

① Clearance, left side:	0.5 feet x 100 CFM per ft = 50 CFM	
② Gas convection oven:	3.5 feet x 175 CFM per ft = 613 CFM	152mm x 155 L/S per m = 24 L/S
③ Gas deep fryer:	1.5 feet x 265 CFM per ft = 398 CFM	1067mm x 270 L/S per m = 288 L/S
④ Spacer:	1.5 feet x 100 CFM per ft = 150 CFM	457mm x 409 L/S per m = 187 L/S
⑤ Electric griddle:	3 feet x 255 CFM per ft = 765 CFM	457mm x 155 L/S per m = 70 L/S
⑥ Gas stove:	3 feet x 275 CFM per ft = 825 CFM	914mm x 395 L/S per m = 361 L/S
⑦ Clearance, right side:	0.5 feet x 100 CFM per ft = 50 CFM	914mm x 426 L/S per m = 389 L/S
<b>Total :</b>	<b>2,851 CFM</b>	<b>1,343 L/S</b>

Total: 2,851 CFM x 1.0 (factor according to your type of installation<sup>5</sup>) / 1,343 CFM x 1.0 (factor according to your type of installation<sup>5</sup>)

**Notes:**

- 1: The total volume of your calculations for single island hood must be multiplied by the factor according to the type of installation (see page 3).
- 2: The total volume for a double island hood is obtained by adding the two rows of cooking appliances and multiplying the total by the factor according to the type of installation (see page 3).
- 3: A clearance (overhang) of 12 inches (304mm) between each side of the cooking appliances and the hood allow for better extraction and can be calculated as a 6 inch (152mm) clearance without penalty. However, you must take into account any overhang greater than 12 inches (304mm) in your calculations.
- 4: 1 CFM = 0.4719474 L/S
- 5: See chart 2

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### Correction factors according to the type of installation

(Chart 2)

Type of installation	Multiplication factor
Wall-mounted hood	1.0
Single island hood	1.2
Double island hood	1.15
Partial stainless steel end skirt on each side of the hood (see section K)	0.95
Full stainless steel end skirt on each side of the hood (see section K)	0.9
Charbroil or heavy duty range at one end of the canopy or under a single island hood	1.2
Installation hanging height 6'-6" (1,980mm)	1.0
Installation hanging height 7'-0" (2,132mm)	1.1

### Correction factors according to the type of installation

Several types of installation can influence the exhaust performance of a kitchen hood. Use the correction factor after you have calculated the air volume by multiplying your final result with this factor according to your type of installation (see chart 2).

$$\text{Total} = 2851 \text{ CFM} \times 1.0 \text{ (factor according to your type of installation)}$$

The "very intense" category generally includes all solid combustion cooking appliances. This category of cooking appliances releases very volatile and uncontrollable particles. The air volume required may exceed our air volume calculated. In this case, it is important to be able to increase the air volume of the exhaust blower and hood supply. Finally, be sure to abide by all codes and standards such as NFPA 96, local codes, IMC code or any other authority at the time of your calculations.

**HCE**