Engineering Data

Model DX-WM and NDX-WM

MECHANICAL REQUIREMENTS:
The type of cooking equipment and the type and volume of cooking determines the total exhaust volume. Refer to the Master Engineering Table to determine exhaust volume, duct sizes and static pressure.

ELECTRICAL:
An optional Carroll start/stop switch Model CS200 can be provided for each exhaust fan. Refer to the CS200 Switch Spec Sheet for specifications and electrical details.If specified, lights must be on separate 120 Volt circuit.

VENTILATOR LENGTHS:
Maximum unit length is 16'-0" (4877 mm). For greater length, two or more sections must be joined. Check to ensure that there is adequate access into building and kitchen area.

HANGING WEIGHT:
40 LBS per linear foot of ventilator
60 Kg per linear meter of ventilator

Item No:_____ Height:_____

Est. Weight:_____ Exhaust CFM_____

Length:_____ Duct Size:_____

Width:_____ S.P:_____

Refer to **Master Engineering Tables** for:

- Pressure Drop Across Ventilator Table
- Static Pressure v CFM/Linear Ft. Table
- Exhaust Air Rate Table

Refer to **Air & Water-Side Tables** for:

- Air/Water Sizing Table Table
- Water-Wash Flow Rates Table
- Hot Water Inlet Pipe Sizing Table
- Drain Line Sizing Table

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Master Engineering Tables

Static Pressure vs. CFM/Linear Foot Table (W2, W1, and DX Models only)

The table below shows the exhaust air rate, in CFM per linear foot of ventilator length, at various total static pressure drops across the ventilator. Note that the data is for nominal 250 CFM/Ft. extractor (5" nominal depth), nominal 250 CFM/Ft. extractor with "Reduced-Throat" baffling, nominal 400 CFM/Ft. extractor (7" nominal depth), nominal 400 CFM/FT. extractor with "Reduced-Throat" baffling, the MS (multi-slot inlet) extractor, and the MS extractor with "Reduced-Throat" baffling on the heavy inlet slot side.

Multiple ventilator sections which are served by a common exhaust fan will have equal, or nearly equal, total static pressure drops across each of the several ventilator sections. When this is the case, the table below becomes especially helpful in the selection of extractor size and Reduced Throat baffling to achieve equal total static pressure drops across the several ventilator sections under consideration.

Here's an example:

You have two distinct ventilator sections, ducted into a common exhaust fan. The first section serves a battery of hot-top ranges and ovens. Ideally, you would exhaust at the rate of 250 CFM/Ft. over the ranges, and 150 CFM/Ft. over the ovens (by including "Reduced-Throat" baffling). Note that the static pressure drop developed over this section would be 1.33" with a nominal 250 CFM extractor. The second section serves a battery of large kettles which should be exhausted at the rate of 400 CFM/Ft. Note that the static pressure drop developed over this section would be 1.65" with a nominal 400 CFM extractor. A change in design is necessary to get both sections operating at the same total static pressure drop.

In such a situation the 400 CFM/Ft. is controlling, and both ventilators will need to be designed to operate at the higher static pressure drop of 1.65" w.g. At 1.65" pressure drop, it can be seen from the table below that the first section will necessarily operate at 285 CFM/Ft. over the ranges, and 170 CFM/Ft. over the ovens, where Reduced Throat baffling has been installed.

As an alternate possibility, the 400 CFM/Ft. requirement of the second section could be achieved by employing a multiple slot (MS) extractor which would develop 1.50" of static pressure drop at the 400 CFM rate. At this static pressure drop, the first section would exhaust at the rates of 270 and 160 CFM/Ft. This still meets or exceeds the minimum exhaust air rate required for the first section, and a lesser overall exhaust air rate results.

Type of Extractor	Pressure Drop Across Ventilator — Inches W.G.						
	1.33"	1.50"	1.65"	1.70"	2.00"	2.15"	2.40"
250 CFM/Lin. Ft.	250	270	285	300	-	-	-
250 CFM/Lin. Ft. with Reduced-Throat	150	160	170	180	-	-	-
400 CFM/Lin. Ft.	-	-	400	405	450	470	500
400 CFM/Lin. Ft. with Reduced-Throat	-	-	240	245	270	280	300
MS Extractor Heavy/Light	-	400 250/150	425 265/160	435 270/165	480 300/180	500 310/190	530 330/200
MS Extractor Reduced-Throat on heavy side	-	300 150/150	320 160/160	330 165/165	360 180/180	380 190/190	400 200/200

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Master Engineering Tables

Exhaust Air Rate Engineering Sheet

Calculating Exhaust Rates (CFM Per Linear Foot)

The quantity of air to be mechanically exhausted through a commercial kitchen cooking line exhaust ventilator is dependent upon the ventilator configuration, the line-up of appliances being exhausted, the volume of the cooking operation, and the nature of the heating source (e.g., gas or electric). These factors are taken into account by the "Minimum Design CFM Exhaust Rates" table below. To use the table, simply select the type of appliance being ventilated at the left most column, and read horizontally across to the appropriate ventilator configuration and appliance heating source. The CFM (cubic feet per minute of air) shown is per linear foot of ventilator length, left-to-right. When more than one type of appliance is being ventilated, determine the CFM exhaust rate for each and apply the largest rate throughout; but, if more than about 25% of continuous cooking appliances can operate at a lower exhaust rate, that ventilator portion may incorporate "Reduced-Throat" baffling to decrease the exhaust rate over that portion. See the **Static Pressure vs. CFM Table** at the back page of this brochure. For example, a wall canopy ventilator over 8'-0" of gas braising pans and 6'-0" of gas ovens, could exhaust at 250 CFM/FT over the braising pans, and at 150 CFM/FT over the ovens, in accordance with this table.

Minimum Design CFM Exhaust Rates

	Wall Canopy or One Side of Double Island Line Model C		Single Island Style (Single Cooking Line) Model C-MS-CL		Back Shelf and Pass-Over Styles Models WM, PV, PH	
Cooking Equipment	CFM/Lin. Ft. Electric Equip.	CFM/Lin. Ft. Gas Equip.	CFM/Lin. Ft. Electric Equip.	CFM/Lin. Ft. Gas Equip.	CFM/Lin. Ft. Electric Equip.	CFM/Lin. Ft. Gas Equip.
Light Duty (non-grease producing)						
Kettles (Under 20 Gal.)	150	150	300	300	-	-
Ovens & Steamers	150	150	300	300	-	-
Conveyor Ovens (S.D.)	150	150	300	300	-	-
Medium Duty (400°F)						
Kettles (Under 60 Gal.)	250	250	300	300	-	-
Braising Pans/Skillets	250	250	300	300	-	-
Fryers	250	250 [1]	300 [2]	300 [2]	150	250
Pressure Fryers	250	250	300	300	-	-
Griddles	250 [3]	250 [3]	300 [2]	300 [2]	150	250
Grooved Griddles	250	250	300	300	250	250
Hot Top Ranges	250	250	400	400	250	250
Open Burner Ranges	-	250 [3, 4]	-	300 [5]	-	250
Heavy Duty (600°F)						
Kettles (Over 60 Gal.)	400	400	400	400	-	-
Upright Broilers	250	250	300	300	-	-
Char-broilers	300 [6]	400 [6]	400 [6]	500 [7]	250	Consult Factory
Woks	-	300 [2]	-	500	-	-
Extra Heavy Duty (700°F)						
Solid Fuel-burning Equip.	-	500	-	800	-	-

1 For heavy production fryers, increase to 300 CFM/Lin. Ft.
2 For heavy production, increase to 400 CFM/Lin.Ft.
3 For light-duty cooking, can reduce to 150 CFM/Lin.Ft.
4 For saute operations, increase to 300 CFM/Lin.Ft.
5 For saute operations, increase to 400 CFM/Lin.Ft.
6 Calculate exhaust rate by including a 12" overhang at each end of appliance
7 To exhaust at 500 CFM/Lin. Ft., the amount of broiler surface cannot exceed 50% of the cooking line. Calculate exhaust rate per note 6. Otherwise, must exhaust at 600 CFM/Lin. Ft.