

ASHRAE 62.2) is not allowed. For airflow values not listed, use the next higher value. The table is not applicable for systems with airflow greater than 125 cfm at 0.25 inches of water column static pressure.

Table 4-9 – Prescriptive Duct Sizing for Single Fan Exhaust Systems (from 62.2, Table 7.1)

Duct Type	Flex Duct				Smooth Duct			
	Fan Rating (cfm@ 0.25 in. w.c.)	50	80	100	125	50	80	100
Diameter inch	Maximum Length ft.							
3	X	X	X	X	5	X	X	X
4	70	3	X	X	105	35	5	X
5	NL	70	35	20	NL	135	85	55
6	NL	NL	125	95	NL	NL	NL	145
7 and above	NL	NL	NL	NL	NL	NL	NL	NL

This table assumes no elbows. Deduct 15 feet of allowable duct length for each elbow.
 NL = no limit on duct length of this size.
 X = not allowed, any length of duct of this size with assumed turns and fitting will exceed the rated pressure drop.

Example 4-36 – Prescriptive Duct Sizing

Question

I need to provide 75 cfm of continuous ventilation, which I plan to do using a central exhaust fan. I plan to connect the fan to a roof vent termination using flex duct. The duct will be about 8 ft long, with no real elbows, but some slight bends in the duct. What size duct do I need to use?

Answer

From Table 4-9, using the 80 cfm, flex duct column, we find that the maximum length with 4 inch duct is 3 ft, so you cannot use 4 inches duct. With 5 inch duct the maximum length is 70 ft, so that will clearly be adequate. Even if the bend in the duct is treated as an elbow, the allowable length only drops to 55 ft, more than adequate for the 8 ft required.

Example 4-37

Question

For the situation in example 4-36, again providing 75 cfm, what size duct would I need if smooth metal duct were used? In this case the total length would increase to about 10 ft, and there would be 2 elbows.

Answer

Using the 80 cfm, smooth duct column of Table 4-9, we find that the maximum length of 4 inches duct is 35 ft. Subtracting 15 ft for each of the 2 elbows leaves us with 5 ft, which is not long enough. With 5 inch duct the maximum length is 135 ft. Subtracting 15 ft for each of the 2 elbows leaves us with 105 ft, so that will clearly be adequate.

Example 4-38

Question

I will need a 100 cfm range hood. I have two possible duct routings. One is 15 ft long and will require 3 elbows. The other is 35 ft long but only requires one elbow. What size flex duct do I need to use?

Answer

First, let's take the 2 routings and add in the correction for the elbows. Elbow corrections can be either added to the desired length or subtracted from the allowable length. In this case, we know the desired length, so we'll add the elbows. We get 15 ft plus 3 times 15 ft for a total of 60 ft, or 35 ft plus 15 ft equals 50 ft.

Looking at Table 4-9, in the 100 cfm, flex duct column, we find that the maximum length with 5 inches duct is 35 ft, which is less than the adjusted length for either routing. With 6 inches duct, the maximum length is 125 ft, longer than either adjusted length. 6 inch duct would need to be used for either routing. *Note:* The building code may not allow flex duct to be used for the range hood, in which case smooth duct would be required. For smooth duct, 5 inches would be acceptable.

Multi-Branch Exhaust Ducting

From ASHRAE 62.2-2007

Section 7.4 Multi-Branch Exhaust Ducting (62.2 text)

If more than one of the exhaust fans in a dwelling unit shares a common exhaust duct, each fan shall be equipped with a back-draft damper to prevent the recirculation of exhaust air from one room to another through the exhaust ducting system. Exhaust fans in separate dwelling units shall not share a common exhaust duct. Exhaust outlets from more than one dwelling unit may be served by a single exhaust fan downstream of all the exhaust inlets, if the fan is designed and intended to run continuously or if each outlet is equipped with a back-draft damper to prevent cross-contamination when the fan is not running.

ASHRAE Standard 62.2 contains restrictions on several situations where multiple exhausts are connected through a combined duct system. These restrictions are intended to prevent air from moving between spaces through the exhaust ducts.

The first restriction is that if more than one exhaust fan in a dwelling shares a common duct, then each fan must be equipped with a backdraft damper so that air exhausted from one bathroom or unit is not allowed to go into another space. Exhaust fans in multiple dwelling units may not share a common duct.

The other restriction applies to remote fans serving more than one dwelling unit. Sometimes a single remote fan or HRV/ERV will exhaust from several units in a multifamily building. This section does not preclude the use of that type of system, but it does require that either the shared exhaust fan operate continuously or that each unit be equipped with a backdraft damper so that air cannot flow from unit to unit when the fan is off.

In multifamily buildings, fire codes may impose additional restrictions.

4.6.7 Minimum Best Practice Guide: Exhaust-Only Ventilation

See [Appendix 4.A](#) for the 2008 Building Energy Efficiency Standards Residential Indoor Air Quality and Mechanical Ventilation (ASHRAE 62.2) Minimum Best Practices guide – Exhaust-Only Ventilation. The Guide can be used to demonstrate compliance with the ventilation requirements of ASHRAE 62.2 (2007) and Section 150(o) of the Standards, and can also be downloaded from the CEC website at

<http://www.energy.ca.gov/2010publications/CEC-400-2010-006/CEC-400-2010-006.PDF>