

HRV/ERV manufacturers do not allow exhaust ducting from the kitchen because of the heat, moisture, grease, and particulates that should not enter the heat exchange core. Building codes require kitchen exhaust fans to be connected to metal ductwork for fire safety.

Example 4-21 – Ducting Kitchen Exhaust to the Outdoors**Question:**

How do I know what kind of duct I need to use? I've been using recirculating hoods my entire career, now I need to vent to the outdoors. How do I do it?

Answer:

A kitchen range hood or downdraft duct is generally a smooth metal duct that is sized to match the outlet of the ventilation device. It is often a six-inch or seven-inch-round duct, or the range hood may have a rectangular discharge. If it is rectangular, the fan will typically have a rectangular-to-round adapter included. Always use a terminal device on the roof or wall that is sized to be at least as large as the duct. Try to minimize the number of elbows used.

Example 4-22**Question:**

How do I know what the requirements are in my area?

Answer:

Ask your code enforcement agency for that information. Some enforcement agencies will accept metal flex; some will not.

A. Control and Operation for Intermittent Local Exhaust

The choice of control is left to the designer. It can be a manual switch or automatic control like an occupancy sensor. Some exhaust fans have multiple speeds, and some fan controls have a delay-off function that operates the exhaust fan for a set time after the occupant leaves the bathroom. New control strategies continue to come to the market. The only requirement is that there is a control. Title 24, Part 11 may specify additional requirements for the control and operation of intermittent local exhaust.

B. Ventilation Rate for Demand-Controlled Local Exhaust

A minimum exhaust airflow of 100 CFM is required for vented kitchen range hoods, and 300 CFM or 5 ACH is required for other kitchen exhaust fans. A minimum exhaust airflow of 50 CFM is required for bathroom fans.

The 100 CFM requirement for the range hood or microwave/hood combination is the minimum to adequately capture the moisture, particulates, and other products of cooking and/or combustion. Only in kitchens that are enclosed, the exhaust requirement can also be met with either a ceiling or wall-mounted exhaust fan or with a ducted fan or ducted ventilation system that can provide at least five air changes of the kitchen volume per hour. Recirculating range hoods that do not exhaust pollutants to the outside cannot be used to meet the requirements of ASHRAE Standard 62.2 unless paired with an exhaust system that can provide at least five air changes of the kitchen volume per hour.

The 2019 Title 24 Part 6 standards require verification that range hoods are HVI-certified to provide at least one speed setting at which they can deliver at least 100 CFM at a noise level of 3 sones or less. Verification must be in accordance with the procedures in *Reference Residential Appendix RA3.7.4.3*. Range hoods that have a minimum airflow

setting exceeding 400 CFM are exempt from the noise requirement. HVI listings are available at:

https://www.hvi.org/proddirectory/CPD_Reports/section_1/index.cfm

ASHRAE Standard 62.2 limits exhaust airflow when atmospherically vented combustion appliances are located inside the pressure boundary. This is particularly important to observe when large range hoods are installed. Refer to Section 4.6.8.4 below for more information.

Example 4-23 – Ceiling or Wall Exhaust vs Demand-Controlled Range Hood in an Enclosed Kitchen

Question:

I am building a house with an enclosed kitchen that is 12 ft. x 14 ft. with a 10 ft. ceiling. What size ceiling exhaust fan or range hood fan is required?

Answer:

If a range hood exhaust is not used, either 300 CFM or 5 ACH minimum airflow is required. The kitchen volume is 12 ft. x 14 ft. x 10 ft. = 1,680 ft³. Five air changes are a flow rate of 1,680 ft³ x 5/ hr. ÷ 60 min/hr = 140 CFM. So, this kitchen must have a ceiling or wall exhaust fan of 140 CFM. Otherwise, a vented range hood fan that provides at least 100 CFM is required.

4.6.7.2 Continuous Local Exhaust

The Energy Standards allow the designer to install a local exhaust system that operates without occupant intervention continuously and automatically during all occupiable hours. Continuous local exhaust is generally specified when the local exhaust ventilation system is combined with a continuous dwelling unit ventilation system. For example, if the dwelling unit ventilation is provided by a continuously operating exhaust fan located in the bathroom, this fan may also satisfy the local exhaust requirement for that bathroom, provided the fan provides airflow greater than or equal to the minimum continuous local ventilation airflow rate. Continuous local exhaust may also be part of a pickup, or an interior grille, for a remote fan or HRV/ERV system.

Continuously operating bathroom fans must operate at a minimum of 20 CFM. Continuously operating kitchen fans are permitted only for enclosed kitchens. Refer to Tables 5.1 and 5.2 in ASHRAE 62.2 for other local demand controlled and continuous exhaust requirements.

Example 4-24 – Continuous Kitchen Exhaust

Question:

A new house has an open-design, 12 ft. x 18 ft. ranch kitchen with 12 ft. cathedral ceilings. What airflow rate will be required for a continuous exhaust fan?

Answer:

A continuous exhaust fan cannot be used in nonenclosed kitchens. A vented range hood must be provided.

4.6.8 Other Requirements (Section 6 of ASHRAE 62.2)

4.6.8.1 Adjacent Spaces and Transfer Air

From ASHRAE 62.2,

6.1 Adjacent Spaces and Transfer Air. Measures shall be taken to minimize air movement across envelope components to dwelling units from adjacent spaces such as garages, unconditioned crawlspaces, unconditioned attics, and other dwelling units. Pressure boundary wall, ceiling, and floor penetrations shall be sealed, as shall