

CHAPTER 15

EXHAUST SYSTEMS

SECTION M1501 GENERAL

M1501.1 Outdoor discharge. The air removed by every mechanical exhaust system shall be discharged to the outdoors. Air shall not be exhausted into an attic, soffit, ridge vent or crawl space.

Exception: Whole-house ventilation-type attic fans that discharge into the attic space of dwelling units having private attics shall be permitted.

SECTION M1502 CLOTHES DRYER EXHAUST

M1502.1 General. Dryer exhaust systems shall be independent of all other systems, and shall convey the moisture to the outdoors.

Exception: This section shall not apply to listed and labeled condensing (ductless) clothes dryers.

M1502.2 Duct termination. Exhaust ducts shall terminate on the outside of the building. Exhaust duct terminations shall be made with a full opening exhaust outlet or in accordance with the dryer manufacturer's installation instructions. Exhaust ducts shall terminate not less than 3 feet (914 mm) in any direction from openings into buildings. Exhaust duct terminations shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination.

M1502.3 Duct size. The diameter of the exhaust duct shall be a minimum of 4 inches (102 mm) or as required by the clothes dryer's listing and the manufacturer's installation instructions.

M1502.4 Transition ducts. Transition ducts shall not be concealed within construction. Flexible transition ducts used to connect the dryer to the exhaust duct system shall be limited to single lengths, not to exceed 8 feet (2438 mm) in length.

M1502.5 Duct construction. The entire exhaust system, excluding transition ducts, shall be supported and secured in place. Exhaust ducts shall be constructed of minimum 0.016-inch-thick (0.4 mm) rigid metal ducts, having smooth interior surfaces with joints running in the direction of air flow. Exhaust ducts shall not be connected with sheet-metal screws or fastening means which extend into the duct.

M1502.6 Exhaust penetrations. Ducts that exhaust clothes dryers shall not penetrate or be located within any fire-blocking, draft-stopping or any wall, floor/ceiling or other assembly required by this code to be fire-resistance rated, unless such duct is constructed of galvanized steel or aluminum of the thickness specified in Table M1601.1.1(2) and the fire-resistance rating is maintained in accordance with Section R317. Fire dampers, combination fire/smoke dampers and any similar devices that will obstruct the exhaust flow, shall be prohibited in clothes dryer exhaust ducts.

M1502.7 Duct length. The maximum length of a clothes dryer exhaust duct shall not exceed 25 feet (7620 mm) from the dryer location to the wall or roof termination. The maximum length of the duct shall be reduced 2.5 feet (762 mm) for each 45-degree (0.79 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.

1. Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for such dryer are provided to the building official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions.
2. Where large-radius 45-degree (0.8 rad) and 90-degree (1.6 rad) bends are installed, determination of the equivalent length of clothes dryer exhaust duct for each bend shall be per fitting manufacturer's installation instructions.

M1502.8 Rough-in required. Where a compartment or space for a clothes dryer is provided, an exhaust duct system shall be installed.

M1502.9 Makeup air. Installations exhausting more than 200 cfm (0.09 m³/s) shall be provided with makeup air. Where a closet is designed for the installation of a clothes dryer, an opening having an area of not less than 100 square inches (0.0645 m²) shall be provided in the closet enclosure.

SECTION M1503 RANGE HOODS

M1503.1 General. Range hoods shall discharge to the outdoors through a single-wall duct. The duct serving the hood shall have a smooth interior surface, shall be air tight and shall be equipped with a backdraft damper. Ducts serving range hoods shall not terminate in an attic or crawl space or areas inside the building.

M1503.2 Duct material. Single-wall ducts serving range hoods shall be constructed of galvanized steel, stainless steel or copper.

Exception: Ducts for domestic kitchen cooking appliances equipped with down-draft exhaust systems shall be permitted to be constructed of schedule 40 PVC pipe provided that the installation complies with all of the following:

1. The duct shall be installed under a concrete slab poured on grade; and
2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel; and
3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface; and

4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building; and
5. The PVC ducts shall be solvent cemented.

M1503.3 Clearance. Overhead exhaust hoods shall be constructed of metal, not less than 0.016 inch (0.4 mm) (No. 28 gage). A clearance of at least 24 inches (610 mm) shall be maintained between the cooking surface and any combustible material above.

1. Combination microwave oven/ventilating hoods installed in accordance with Section M1504.1.
2. Downdraft exhaust systems.

M1503.4 Kitchen exhaust rates. Domestic kitchen cooking appliances shall be equipped with a ducted range hoods or down-draft exhaust system and shall be sized in accordance with Section M1507.3.

Exception: Continuously operated mechanical ventilation systems designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.3.

**SECTION M1504
INSTALLATION OF MICROWAVE OVENS**

M1504.1 Installation of microwave oven over a cooking appliance. The installation of a listed and labeled cooking appliance or microwave oven over a listed and labeled cooking appliance shall conform to the terms of the upper appliance's listing and label and the manufacturer's installation instructions. The microwave oven shall conform to UL 923.

**SECTION M1505
OVERHEAD EXHAUST HOODS**

M1505.1 General. Domestic open-top broiler units shall be provided with a metal exhaust hood, not less than 28 gage, with 1/4 inch (6 mm) between the hood and the underside of combustible material or cabinets. A clearance of at least 24 inches (610 mm) shall be maintained between the cooking surface and the combustible material or cabinet. The hood shall be at least as wide as the broiler unit and shall extend over the entire unit. Such exhaust hood shall discharge to the outdoors and shall be equipped with a backdraft damper or other means to control infiltration/exfiltration when not in operation. Broiler units incorporating an integral exhaust system, and listed and labeled for use without an exhaust hood, need not be provided with an exhaust hood.

**SECTION M1506
EXHAUST DUCTS**

M1505.1 Ducts. Where exhaust duct construction is not specified in this chapter, such construction shall comply with Chapter 16.

**SECTION M1507
MECHANICAL VENTILATION**

M1507.1 General. Where Section R303.3 requires toilet rooms, bathrooms and rooms with bathing or spa facilities to be mechanically ventilated, the ventilation equipment shall be installed in accordance with this section.

M1507.1.1 Duct sizing. Prescriptive exhaust duct sizing shall be in accordance with Table M1507.4.

M1507.2 Recirculation of air. Exhaust air from range hoods, bathrooms, toilet rooms and rooms with bathing or spa facilities shall not be recirculated within a residence or to another dwelling unit and shall be exhausted directly to the outdoors. Exhaust air from range hoods, bathrooms, toilet rooms and rooms with bathing or spa facilities shall not discharge into an attic, crawl space or other areas inside the building.

M1507.3 Ventilation rate. Ventilation systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.3. Exhaust flow ratings for source specific ventilation systems shall be in accordance with Home Ventilating Institute (HVI) or Air Movement and Control Association (AMCA) residential ventilation standards.

M1507.3.1 Sound ratings for fans in rooms containing bathing and spa facilities.

M1507.3.1.1 Continuous ventilation fans. Continuous ventilation fans shall be rated for sound at a maximum of 1.0 sone.

M1507.3.1.2 Intermittent fans. Intermittent fans shall be rated for sound at a maximum of 3 sone, unless their maximum rated airflow exceeds 400 cfm (200 L/s).

M1507.3.1.3 Remote fans. Remotely installed fans that are at least 4 feet (1220 mm) away from the inlet grill are exempt from the sone rating requirements of M1507.3.1.1 and M1507.3.1.2.

M1507.4 Rooms with bathing or spa facilities. All rooms containing bathing or spa facilities shall be provided with a mechanical ventilation system controlled by a dehumidistat, timer or similar means of automatic control.

**TABLE M1507.3
EXHAUST RATES FOR RESIDENTIAL DWELLINGS**

Domestic Kitchens	
Range hoods/downdraft exhaust	Min. 150 cfm intermittent or 25 cfm continuous
Bathrooms—Toilet Rooms	
Rooms containing bathing and spa facilities (Static pressure shall be rated @ 0.10 inch water gauge for intermittent fans)	Min. 80 cfm intermittent or 20 cfm continuous.
Toilet rooms without bathing or spa facilities, when not provided with natural ventilation per R303.3.2.	Min. 50 cfm

For SI: 1 cubic foot per minute = 0.422 L/s.

**TABLE M1507.4
PRESCRIPTIVE EXHAUST DUCT SIZING**

Fan tested CFM @ 0.10 in. W.G.	Minimum flex (diameter)	Maximum Length (feet)	Minimum smooth (diameter)	Maximum length (feet)	Maximum elbows ^a
50	4"	25	4"	70	3
	5"	90	5"	100	3
	6"	No limit	6"	No limit	3
80	4" ^b	N/A	4"	20	3
	5"	15	5"	100	3
	6"	.90	6"	No limit	3
100	5" ^b	N/A	5"	50	3
	6"	45	6"	No limit	3
125	6"	15	6"	No limit	3
	7"	70	7"	No limit	3

a. For each additional elbow subtract 10 feet from length.

b. Flex ducts of this diameter are not permitted with fans of this size.

