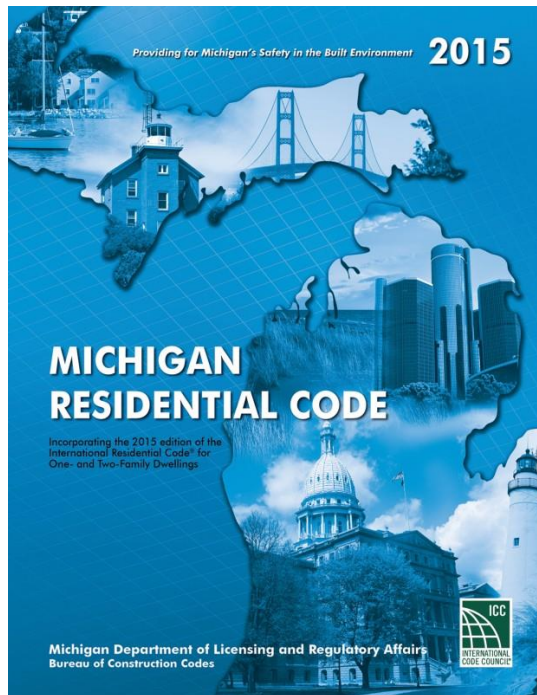


Mechanical Code Changes for 2015 Michigan Residential Code

Metro Mechanical Inspectors Association



Conflicts within this code book.

R102.1 General. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

Example Section : N1103.3.5 (R403.3.5) Building cavities versus: M1601.1 section 7 Stud wall cavities and the spaces between solid floor joists to be utilized as air plenums .

New Definitions.

[RB] THIRD-PARTY CERTIFICATION AGENCY. An approved agency operating a product or material certification system that incorporates initial product testing, assessment and surveillance of a manufacturer's quality control system.

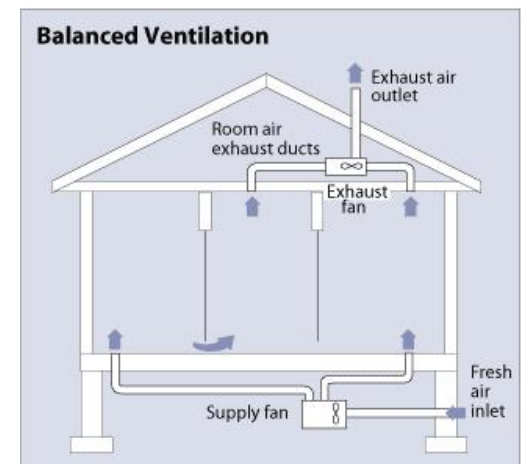
[RB] THIRD PARTY CERTIFIED. Certification obtained by the manufacturer indicating that the function and performance characteristics of a product or material have been determined by testing and ongoing surveillance by an approved third-party certification agency. Assertion of certification is in the form of identification in accordance with the requirements of the third-party certification agency.

[RB] THIRD-PARTY TESTED. Procedure by which an approved testing laboratory provides documentation that a product material or system conforms to specified requirements.

WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM.

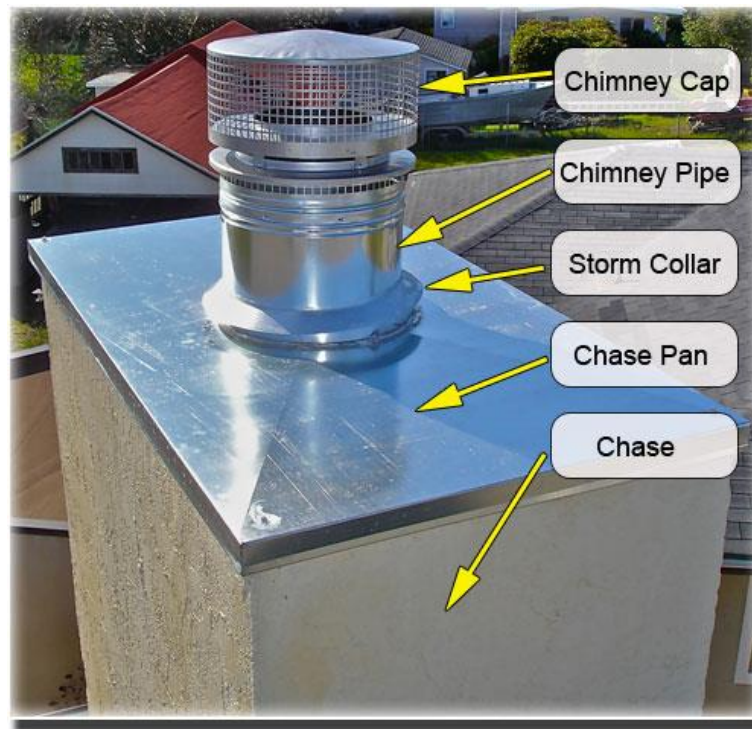
An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air where operating continuously or through a programmed intermittent schedule to satisfy the whole-house ventilation rate.

For definition applicable in Chapter 11, see Section N1101.6.



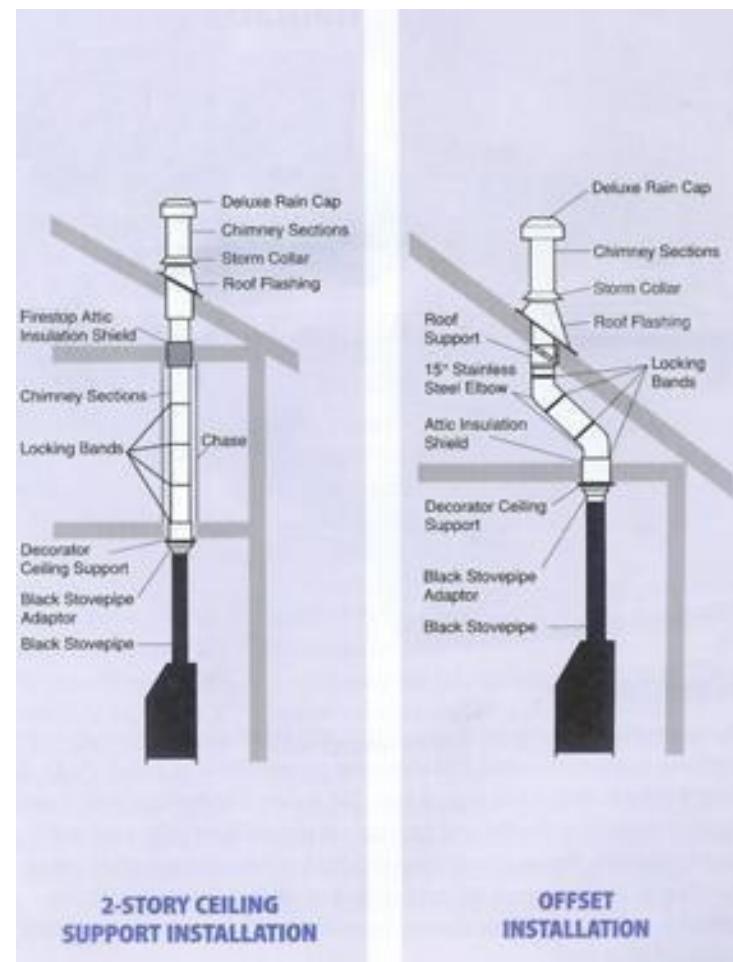
Factory Built Chimneys R1005

R1005.4 Cover needs to be pitch 10 degrees on top of chase of chimney and the metal chase cover shall lap down 4”



R1005.7 Factory-built chimney offsets.

Where a factorybuilt chimney assembly incorporates offsets, no part of the chimney shall be at an angle of more than 30 degrees (0.52 rad) from vertical at any point in the assembly and the chimney assembly shall not include more than four elbows.

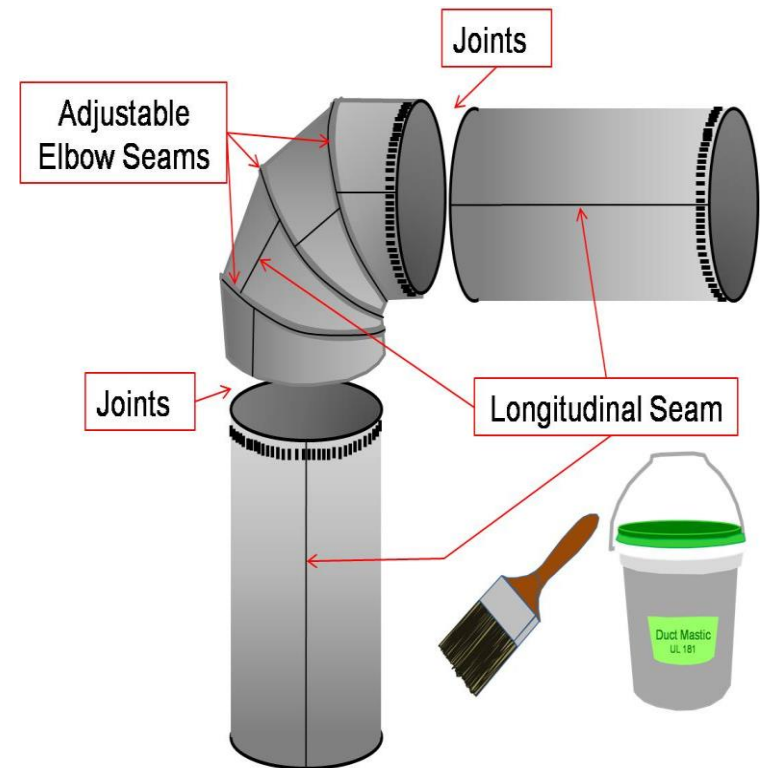


N1103.2.2 (R403.3.2) Sealing

N1103.3.2 (R403.2.2) Sealing

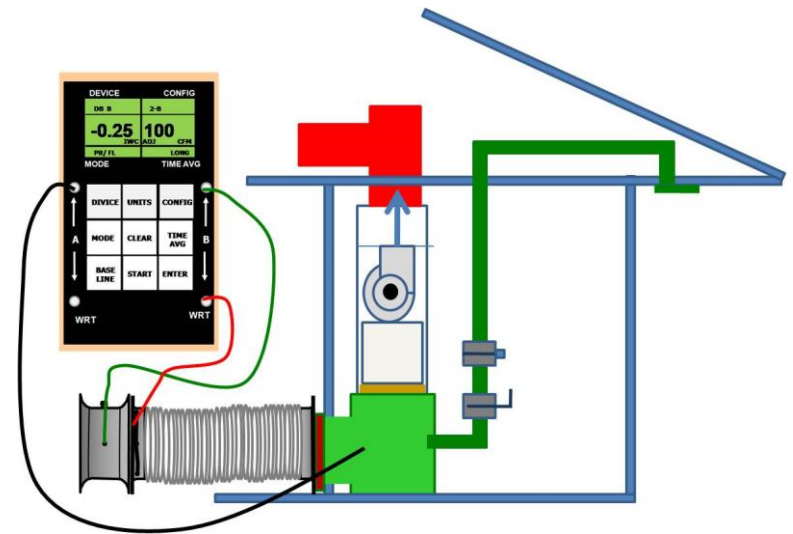
(Mandatory). Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with either the *International Mechanical Code* or Section M1601.4.1 of this code, as applicable.

2. For ducts having a static pressure classification of less than 2 inches of water column (500 Pa), additional closure systems shall not be required for continuously welded joints and seams, and locking-type joints and seams of other than the snap-lock and button-lock types. *Deleted in MRC 11th chapter but pick back up in duct chapter*

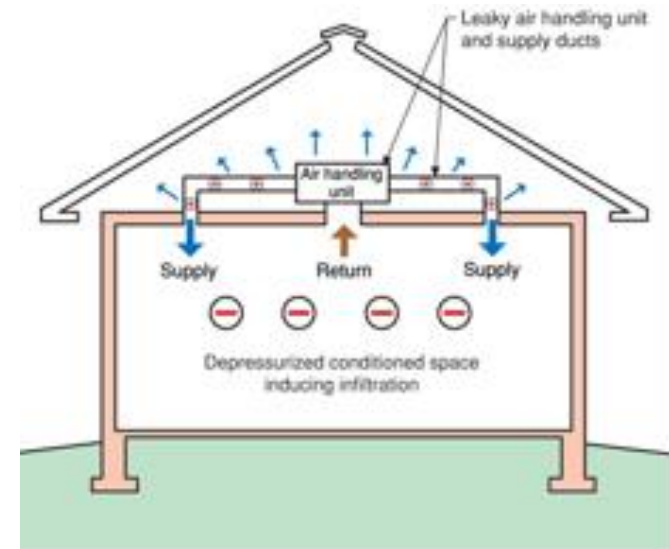


N1103.2.2 (Continued. Duct tightness shall be verified by either of the following)

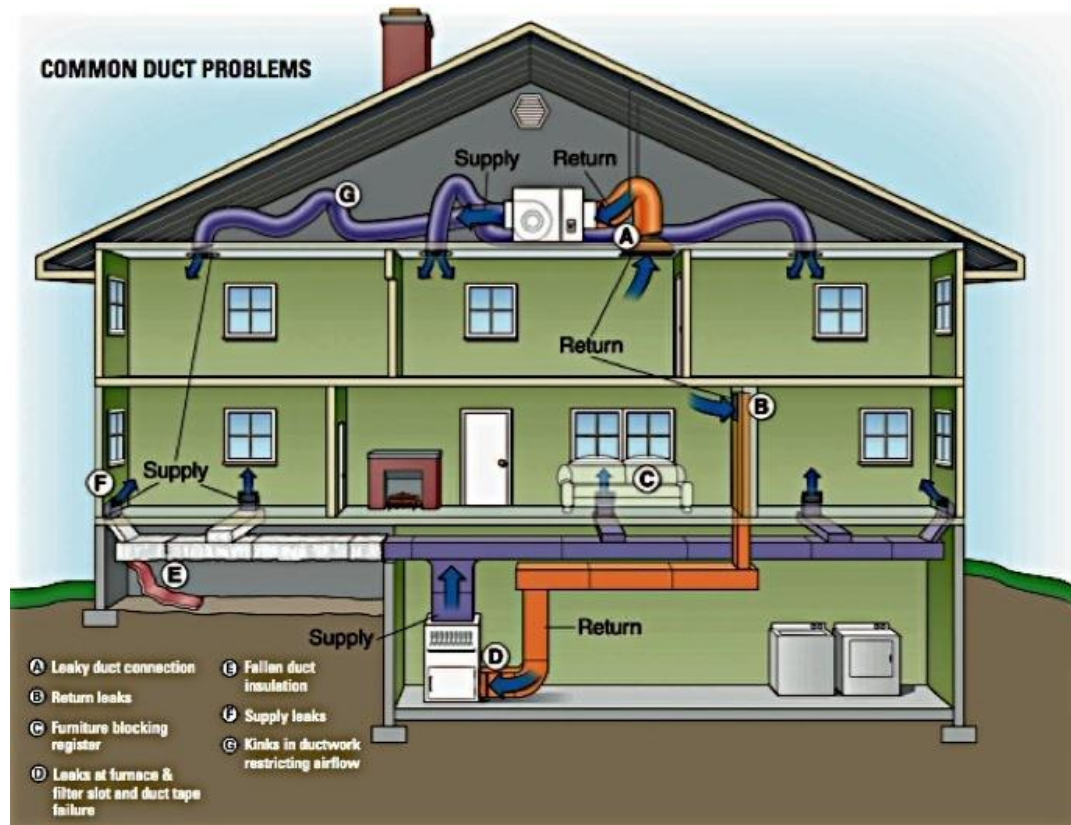
- 1. Post construction test: total leakage to the to the outside of a conditioned space or total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 square feet (9.29 m²) of conditioned floor area when tested at a pressure differential of 0.1 inches (2.54 mm) w.g. (25 Pa) across the entire system, including the manufacturer's air handler disclosure. All register boots shall be taped or otherwise sealed during the test.



- 2. Rough-in test: total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 square feet (9.29 m²) of conditioned floor area when tested at a pressure differential of 0.1 inches (2.54 mm) w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure. All registers shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 3 cfm (85 L/min) per 100 square feet (9.29 m²) of conditioned floor area.



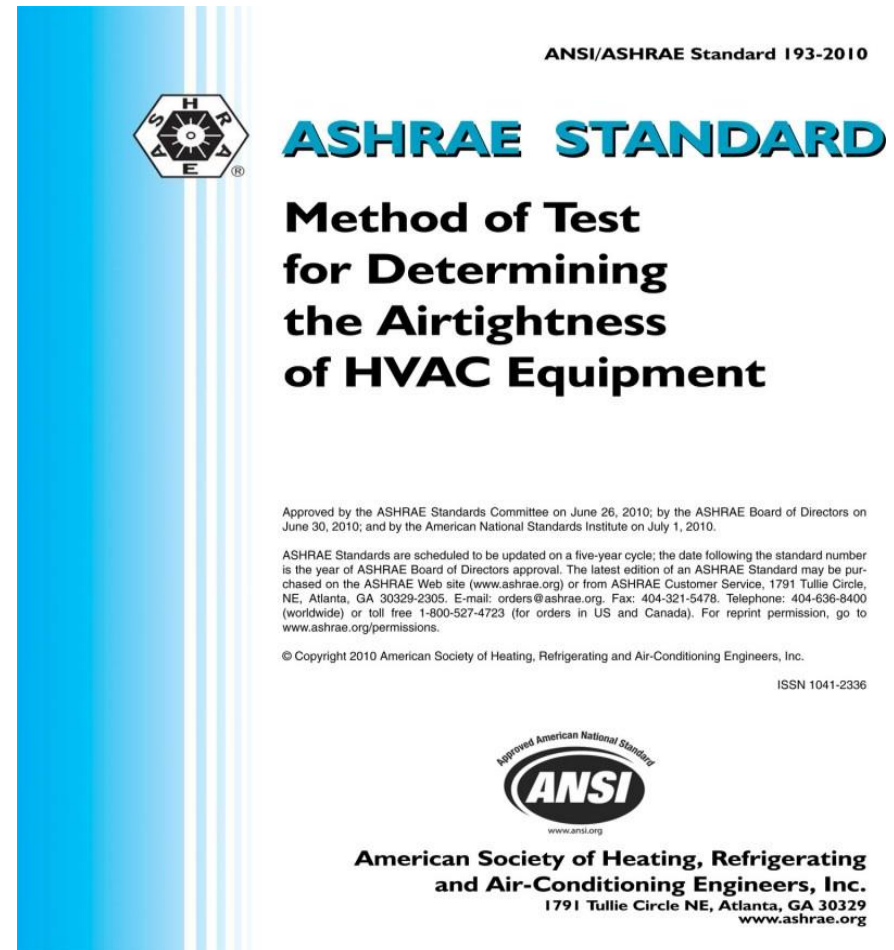
Exception: The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.



<http://support.energyconservatory.com/hc/en-us/articles/202951664-Duct-Blaster-Videos>

N1103.2.2.1 Sealed air Handler

- Sealed air handler. **Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.**



N1103.3.3 (R403.2.3) Building cavities (Mandatory).

Building framing cavities shall not be used as ducts or plenums.



Excerpt form Building Science Corp. Info 801

The practice of using unsealed building cavities as ductwork may result in indoor air quality issues. The negatively pressurized cavities will draw air through any cracks to try to alleviate the pressure difference. This means that the return system will suck on the walls—and any contaminants that might be in the walls—and redistribute them to the living space. By negatively pressuring the walls in a hot-humid [climate](#), warm humid air could be drawn into the walls from the exterior, and condensation is likely to occur on the cooler air-conditioned surfaces.

N1103.5 (R403.5) Mechanical ventilation (Mandatory).

- The building shall be provided with ventilation that meets the
- requirements of Section M1507 of this code or the *International Mechanical Code*, as applicable, or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.



N1103.5(R403.5) Mechanical ventilation (Mandatory).

Table R403.5.1: Mechanical Ventilation System Fan Efficacy

Fan Location	Airflow Rate Minimum (cfm)	Minimum Efficacy (cfm/W)	Airflow Rate Maximum (cfm)
Range hoods	Any	2.8	Any
In-line fan	Any	2.8	Any
Bathroom, utility room	10	1.4	<90
Bathroom, utility room	90	2.8	Any

For SI: 1 cfm = 28.3 L/min.



N1103.5.1 (R403.5.1) Whole-house mechanical ventilation system fan efficacy. Mechanical ventilation system fans shall meet the efficacy requirements of Table

Exception: Where mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.

Third party certification & identification of PIPE M1301

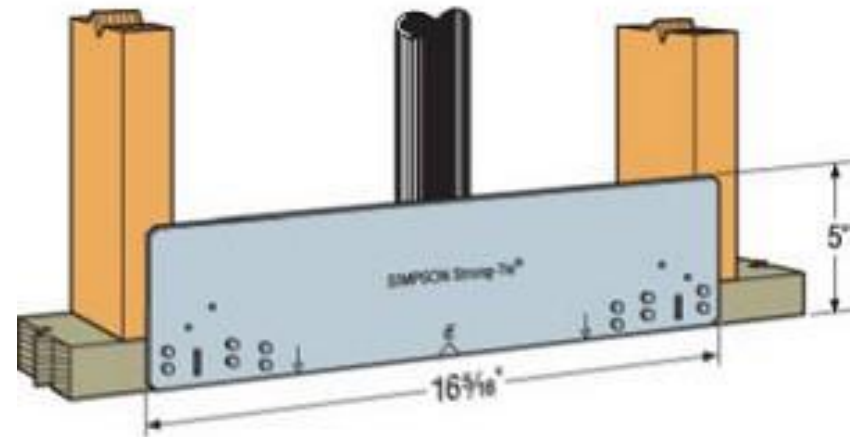
- Same as the changes in the 2012 Michigan Mechanical Code & 2012 International Fuel Gas code.
- Some imported pipe and fittings are not.



Look for this mark - it's your assurance
of quality, safety and performance

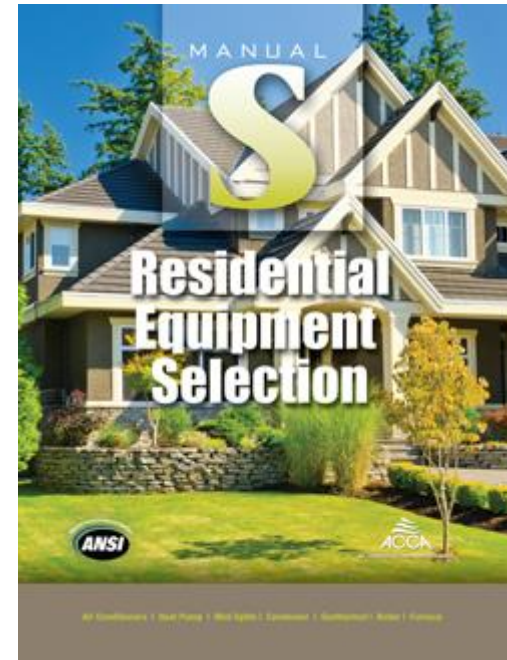
M1308 Pipe Protection – Extension

- Where the framing member that the piping passes through is a bottom plate, bottom track, top plate or top track, the shield plates shall cover the framing member and extend 2 inches (51 mm) above the bottom framing member and 2 inches (51 mm) below the top framing member.



M1401.3 Equipment and appliance sizing exception

1. The specified equipment or appliance utilizes multistage technology or variable refrigerant flow technology
- 2. The approved heating and cooling calculation methodology and the next larger standard size unit is specified.



M1411.7 Location and protection of refrigerant piping

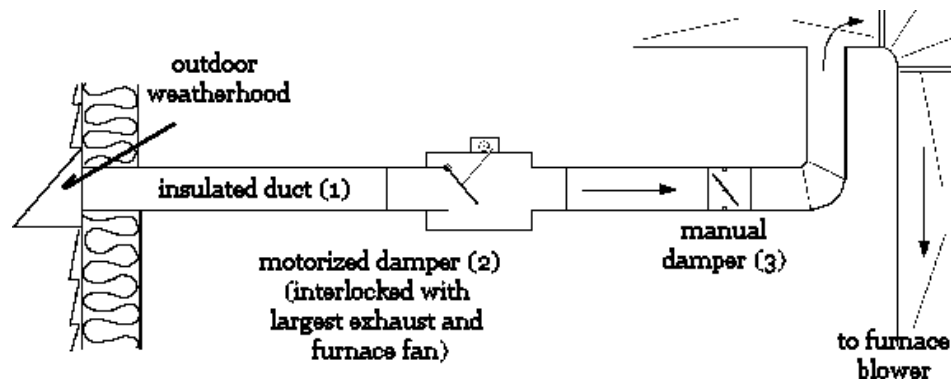
- Refrigerant piping installed within 1 1/2 inches (38 mm) of the underside of roof decks shall be protected from damage caused by nails and other fasteners.



Especially prominent where ACR tubing goes through Soffit

Kitchen exhaust Make up air location

- M1503.4.1 Location. Kitchen exhaust makeup air shall be discharged into the same room in which the exhaust system is located or into rooms or *duct systems* that communicate through one or more permanent openings with the room in which such exhaust system is located. Such permanent openings shall have a net cross-sectional area not less than the required area of the makeup air supply openings.



Exhaust Duct Length

M1506.2 Duct length. The length of exhaust and supply ducts used with ventilating equipment shall not exceed the

lengths determined in accordance with Table M1506.2.

Exception: Duct length shall not be limited where the duct system complies with the manufacturer's design criteria

or where the flow rate of the installed ventilating equipment is verified by the installer or approved third party using a flow hood, flow grid or other airflow

measuring

device.

**TABLE M1506.2
DUCT LENGTH**

DUCT TYPE	FLEX DUCT								SMOOTH-WALL DUCT								
	50	80	100	125	150	200	250	300	50	80	100	125	150	200	250	300	
Fan airflow rating (CFM @ 0.25 inch wc ^a)																	
Diameter ^b (inches)	Maximum length ^{c, d, e} (feet)																
3	X	X	X	X	X	X	X	X	5	X	X	X	X	X	X	X	
4	56	4	X	X	X	X	X	X	114	31	10	X	X	X	X	X	
5	NL	81	42	16	2	X	X	X	NL	152	91	51	28	4	X	X	
6	NL	NL	158	91	55	18	1	X	NL	NL	NL	168	112	53	25	9	
7	NL	NL	NL	NL	161	78	40	19	NL	NL	NL	NL	NL	148	88	54	
8 and above	NL	NL	NL	NL	NL	189	111	69	NL	NL	NL	NL	NL	NL	198	133	

For SI: 1 foot = 304.8 mm.

- a. Fan airflow rating shall be in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.
- b. For noncircular ducts, calculate the diameter as four times the cross-sectional area divided by the perimeter.
- c. This table assumes that elbows are not used. Fifteen feet of allowable duct length shall be deducted for each elbow installed in the duct run.
- d. NL = no limit on duct length of this size.
- e. X = not allowed. Any length of duct of this size with assumed turns and fittings will exceed the rated pressure drop.

SECTION M1507

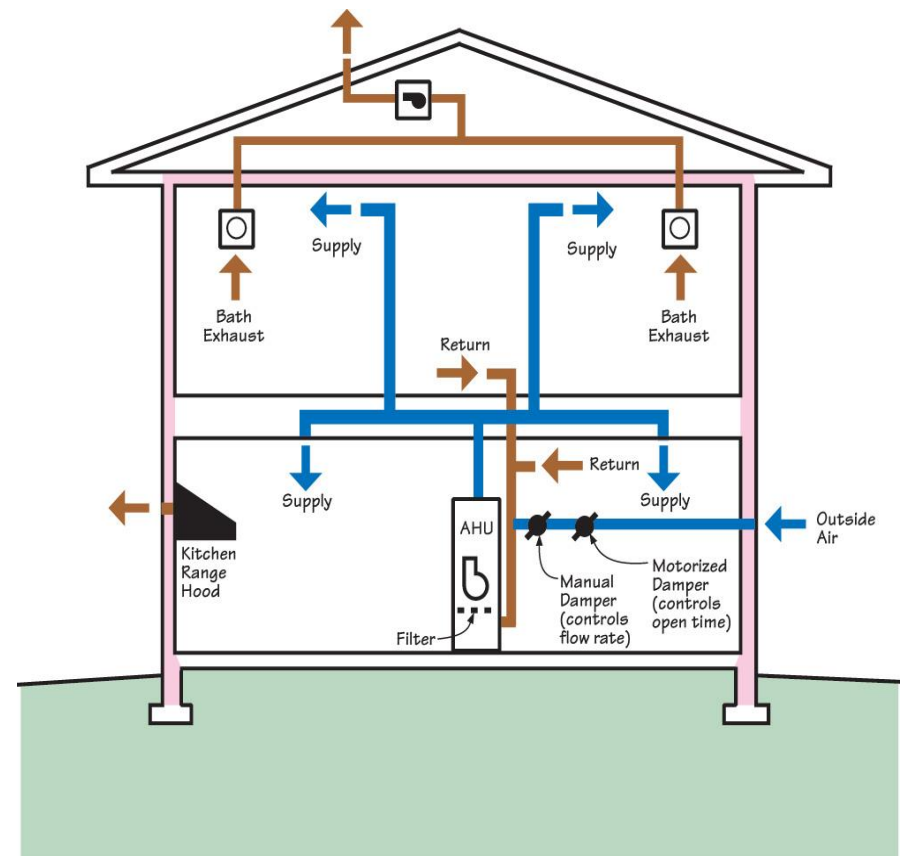
MECHANICAL VENTILATION

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



M1507.3 Whole-house mechanical ventilation system.

M1507.3.1 System design. The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered as providing supply ventilation.



M1507.3.2 System controls. & Mechanical ventilation rate

- Must provide manual override
- Mechanical Rate per Table 1507.3.3(1) - 1507.3.3(2)

Table 2. Minimum continuous ventilation rates from the 2012 IRC

Continuous Whole-House Mechanical Ventilation System Airflow Rate Requirements [Table M1507.3.3(1)]

Dwelling Unit Floor Area (square feet)	Number of Bedrooms				
	0-1	2-3	4-5	6-7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 - 3,000	45	60	75	90	105
3,001 - 4,500	60	75	90	105	120
4,501 - 6,000	75	90	105	120	135
6,001 - 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

Table 3. Intermittent ventilation rates from the 2012 IRC

Intermittent Rate Factors ^{a,b} [Table M1507.3.3(2)]

Run-Time Percentage in each 4-hour segment	25%	33%	50%	66%	75%	100%
Factor ^a	4	3	2	1.5	1.3	1.0

M1507.4 Local exhaust rates.

- *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.4.

TABLE M1507.4
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR
ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE EXHAUSTED	EXHAUST RATES
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m³/s.



M1601.1.1 section 4 and M1601.4

- SMACNA HVAC *Duct Construction Standards—Metal and Flexible* had added for duct construction & Duct sealing as a reference

HVAC DUCT
CONSTRUCTION
STANDARDS-METAL &
FLEXIBLE



SHEET METAL AND AIR CONDITIONING
CONTRACTORS NAT. ASSO. INC.

M1601.1.1 (7) Stud wall cavities.

- Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:
- 7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.

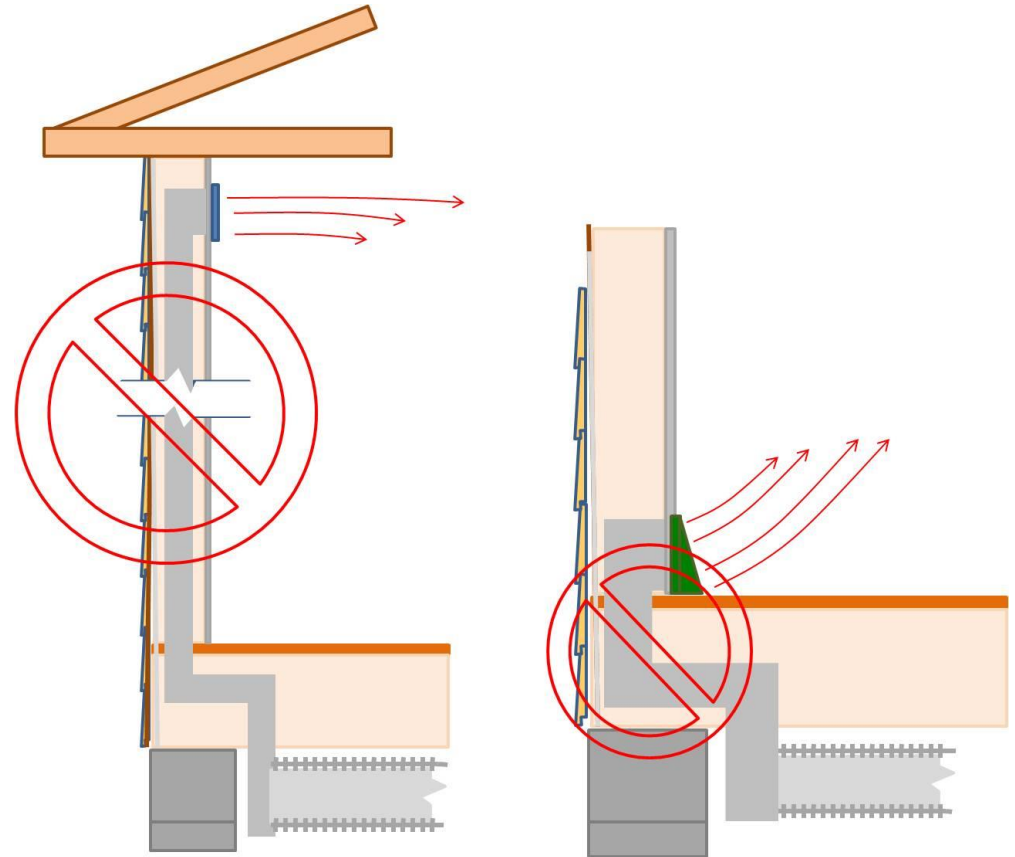


Table M1601.1.1 Sheet metal thickness change

Thickness increase for larger width ducts

DUCT SYSTEMS

TABLE M1601.1.1
DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESS FOR SINGLE DWELLING UNITS^a

ROUND DUCT DIAMETER (inches)	STATIC PRESSURE			
	$\frac{1}{2}$ inch water gage		1 inch water gage	
	Thickness (inches)		Thickness (inches)	
	Galvanized	Aluminum	Galvanized	Aluminum
≤ 12	0.013	0.018	0.013	0.018
12 to 14	0.013	0.018	0.016	0.023
15 to 17	0.016	0.023	0.019	0.027
18	0.016	0.023	0.024	0.034
19 to 20	0.019	0.027	0.024	0.034

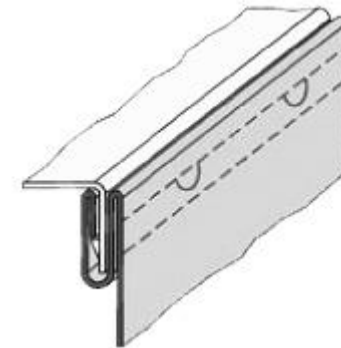
RECTANGULAR DUCT DIMENSION (inches)	STATIC PRESSURE			
	$\frac{1}{2}$ inch water gage		1 inch water gage	
	Thickness (inches)		Thickness (inches)	
	Galvanized	Aluminum	Galvanized	Aluminum
≤ 8	0.013	0.018	0.013	0.018
9 to 10	0.013	0.018	0.016	0.023
11 to 12	0.016	0.023	0.019	0.027
13 to 16	0.019	0.027	0.019	0.027
17 to 18	0.019	0.027	0.024	0.034
19 to 20	0.024	0.034	0.024	0.034

For SI: 1 inch = 25.4 mm, 1 inch water gage = 249 Pa.

a. Ductwork that exceeds 20 inches by dimension or exceeds a pressure of 1 inch water gage (249 Pa) shall be constructed in accordance with SMACNA *RTAC Duct Construction Standards—Metal and Flexible*.

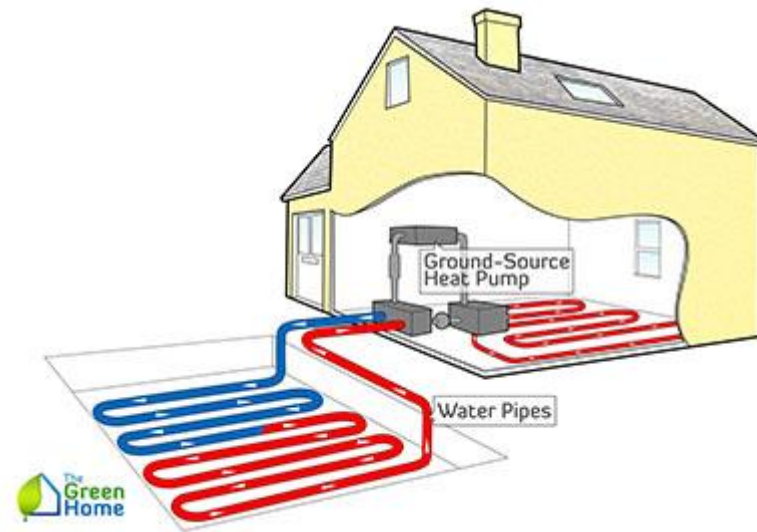
M1601.4.1 Joints seams and connections

- 3. For ducts having a static pressure classification of less than 2 inches of water column additional closure systems shall not be required for continuously welded joints and seams and locking-type joints and seams of other than the snap-lock and button-lock types.



Chapter 2105 is completely redone

Heat pump System loop Piping



G2417.7.1.3 (406.7.1.3) Outdoor discharge of purged gases.

- The open end of a *piping* system being pressure vented or purged shall discharge directly to an outdoor location.
- 3. During discharge, the open point of discharge shall be continuously attended and monitored with a combustible gas indicator that complies with Section G2417.7.1.4.

