

1322.1103 IRC SECTION N1103, SYSTEMS.

IRC Section N1103 is deleted in its entirety and replaced with the following:

N1103.1 Controls. At least one thermostat shall be provided for each separate heating and cooling system.

N1103.2 Ducts.

N1103.2.1 Insulation. Ducts shall be insulated in accordance with the Minnesota Mechanical Code, chapter 1346.

Exception: Ducts for which heat gain or loss, without insulation, will not increase the energy requirements of the building.

MINIMUM REQUIRED INSULATION

(see notes for explanations)

Duct Location	Requirements
Attics, garages, and ventilated crawl spaces	R-8 and V
Exterior of building	R-8, V and W
Inside of building and in unconditioned spaces less than or equal to 15 degrees Fahrenheit	None required
TD greater than 15 degrees Fahrenheit and less than or equal to 40 degrees Fahrenheit	R-3.3 and V
TD greater than 40 degrees Fahrenheit	R-5 and V
Within conditioned spaces, in basements with insulated walls, and in plenums within conditioned spaces	None required
Intake and exhaust ducts within conditioned spaces*	R-3.3 and V
Within cement slab or within ground (also see IMC Section 603.7)	R-3.5

Notes:

* Insulation required for a distance of 3 feet (914 mm) from the exterior.

TD = Design temperature differential between the air in the duct and the ambient temperature outside of the duct.

V = Vapor retarder required in accordance with the IMC Section 604.11. When a vapor retarder is required, duct insulation required by this section shall be installed without respect to other building envelope insulation.

W = Approved weatherproof barrier.

N1103.2.2 Sealing. Ducts shall be sealed in accordance with the Minnesota Mechanical Code, chapter 1346.

Location	Design Static Pressure	Minimum Required Sealing
All locations	Greater than 3.0 inches (750Pa) water gauge	All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed. Ductwork shall be equal to or less than Leakage Class 6 as defined in Section 4 of the SMACNA HVAC Duct Leakage Test Manual*
Portions of return air ducts completely inside the vapor retarder/air barrier enclosing conditioned space	3.0 inches (750Pa) water gauge and less	All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed
Portions of return air ducts in the same space as an atmospherically vented or fan-assisted appliance	3.0 inches (750Pa) water gauge and less	All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed

All locations	Greater than 0.50 to 3.0 inches (125 to 750Pa) water gauge	All transverse joints and duct wall penetrations shall be sealed
All locations	0.50 inches (125Pa) water gauge and less	All transverse joints, longitudinal seams, and duct wall penetrations shall have no visible gaps and shall be sufficiently airtight according to Section 1.7 of the SMACNA HVAC Duct Construction Standards - Metal and Flexible

N1103.2.3 Supply ducts. Supply ducts shall be continuously ducted according to the Minnesota Mechanical Code, chapter 1346, from the point of origin to the point of discharge in the habitable spaces. The building framing cavities and building components shall not be used as supply ducts.

N1103.2.4 Domestic water piping insulation. Pipe insulation shall have a k-value of 0.27. If the K-value of a product is less than 0.27, then the pipe thickness shall be adjusted to have an equivalent R-value.

A. Cold water piping: no insulation required.

Exception: All piping located within 6 inches of any heating pipes shall have a minimum of 1 inch insulation with an appropriate vapor jacket.

B. Hot water piping: no insulation required.

Exceptions:

1. All recirculating systems shall have a minimum of 0.5 inch insulation on the entire loop with an appropriate vapor jacket.
2. All underground piping shall have a minimum of 1 inch insulation with an appropriate vapor jacket.

N1103.2.5 HVAC Piping. Hydronic, steam, and condensate piping in all locations shall be insulated in accordance with the Minnesota Mechanical Code, chapter 1346.

Exceptions:

1. Piping installed within HVAC equipment.
2. Piping installed in basements, crawl spaces, and cellars.

Table N1103.2.4						
Insulation Thickness for Nominal Pipe Diameters						
Fluid Temperature Range Degrees Fahrenheit	Runouts (see item C)	1 inch (25.4 mm and less)	1.25 to 2 inches (31.7 to 50.8 mm)	2.5 to 4 inches (63.5 to 101.6 mm)	5 to 6 inches (127 to 152 mm)	8 inches (203 mm) and larger
Piping System Type - Heating						
Above 350	1.5	2.5	2.5	3.0	3.5	3.5
251-350	1.5	2.0	2.5	2.5	3.5	3.5
201-250	1.0	1.5	1.5	2.0	2.0	3.5
141-200	0.5	1.5	1.5	1.5	1.5	1.5
105-140	0.5	1.0	1.0	1.0	1.5	1.5
Piping System Type - Cooling						
40.55	0.5	0.5	0.75	1	1	1
Below 40 (see Item D)	1	1	1.5	1.5	1.5	1.5

A. Insulation thickness in this section assumes a k-value of 0.27. If the k-value of a product is less than 0.22, then the thickness must be adjusted to have an equivalent R-value.

B. For piping exposed to outdoor air, insulation thickness must be 0.5 inch (12.7 mm) greater than required in the table.

C. This column applies only to runouts (branches) 2 inches (50.8 mm) in diameter and less, not exceeding 12 feet (3658 mm) in length, to individual terminal units. All other runouts shall meet the requirements given in other columns in the table, as appropriate.

D. For applications with fluid temperatures of 32 degrees Fahrenheit (0 degrees Celsius) and below, a vapor retarder shall be installed according to IMC Section 604.11.

N1103.2.6 Equipment sizing. Heating and cooling equipment shall be sized per the Minnesota Mechanical Code, chapter 1346, and ACCA Manual J.

N1103.4 Domestic circulating hot water systems. Circulating hot water systems shall include an automatic switch that can turn the hot water circulating pump off when the system is not in use or when the circulating loop temperature is satisfied.

Statutory Authority: *MS s 326B.02; 326B.101; 326B.106; 326B.13*

History: *33 SR 1480*

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