

**(Effective until July 1, 2020)**

**WAC 51-11C-403281 Table C403.2.9—Minimum pipe insulation thickness.**

**Table C403.2.9  
Minimum Pipe Insulation Thickness (thickness in inches)<sup>a</sup>**

| Fluid Operating Temperature Range and Usage (°F) | Insulation Conductivity  |                             | Nominal Pipe or Tube Size (inches) |              |              |          |     |
|--|--|-----------------------------|------------------------------------|--------------|--------------|----------|-----|
|  | Conductivity Btu • in. / (h • ft <sup>2</sup> • °F) <sup>b</sup> | Mean Rating Temperature, °F | < 1                                | 1 to < 1-1/2 | 1-1/2 to < 4 | 4 to < 8 | ≥ 8 |
| > 350  | 0.32 - 0.34  | 250                         | 4.5                                | 5.0          | 5.0          | 5.0      | 5.0 |
| 251 - 350  | 0.29 - 0.32  | 200                         | 3.0                                | 4.0          | 4.5          | 4.5      | 4.5 |
| 201 - 250  | 0.27 - 0.30  | 150                         | 2.5                                | 2.5          | 2.5          | 3.0      | 3.0 |
| 141 - 200  | 0.25 - 0.29  | 125                         | 1.5                                | 1.5          | 2.0          | 2.0      | 2.0 |
| 105 - 140  | 0.21 - 0.28  | 100                         | 1.0                                | 1.0          | 1.5          | 1.5      | 1.5 |
| 40 - 60  | 0.21 - 0.27  | 75                          | 0.5                                | 0.5          | 1.0          | 1.0      | 1.0 |
| < 40   | 0.20 - 0.26  | 75                          | 0.5                                | 1.0          | 1.0          | 1.0      | 1.5 |

<sup>a</sup> For piping smaller than 1-1/2 inch (38 mm) and located in partitions within *conditioned spaces*, reduction of these thicknesses by 1 inch (25 mm) shall be permitted (before thickness adjustment required in footnote b) but not to a thickness less than 1 inch (25 mm).

<sup>b</sup> For insulation outside the stated conductivity range, the minimum thickness (*T*) shall be determined as follows:

$$T = r\{(1 + t/r)^{K/k} - 1\}$$

Where:

*T* = Minimum insulation thickness,

*r* = Actual outside radius of pipe,

*t* = Insulation thickness listed in the table for applicable fluid temperature and pipe size,

*K* = Conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature (Btu × in/h × ft<sup>2</sup> × °F) and

*k* = The upper value of the conductivity range listed in the table for the applicable fluid temperature.

<sup>c</sup> For direct-buried heating and hot water system piping, reduction of these thicknesses by 1-1/2 inches (38 mm) shall be permitted (before thickness adjustment required in footnote b) but not to thicknesses less than 1 inch (25 mm).

[Statutory Authority: RCW 19.27A.025, 19.27A.160, and 19.27.074. WSR 16-03-072, § 51-11C-403281, filed 1/19/16, effective 7/1/16. Statutory Authority: RCW 19.27A.020, 19.27A.025 and chapters 19.27 and 34.05 RCW. WSR 13-04-056, § 51-11C-403281, filed 2/1/13, effective 7/1/13.]

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**WAC 51-11C-403281 Reserved.**

[Statutory Authority: RCW 19.27A.020, 19.27A.025, 19.27A.160 and chapter 19.27 RCW. WSR 19-24-040, § 51-11C-403281, filed 11/26/19, effective 7/1/20. Statutory Authority: RCW 19.27A.025, 19.27A.160, and 19.27.074. WSR 16-03-072, § 51-11C-403281, filed 1/19/16, effective 7/1/16. Statutory Authority: RCW 19.27A.020, 19.27A.025 and chapters 19.27 and 34.05 RCW. WSR 13-04-056, § 51-11C-403281, filed 2/1/13, effective 7/1/13.]