

**INTERPRETATION IC 90.1-2010-01 OF
ANSI/ASHRAE/IES STANDARD 90.1-2010
Energy Standard for Buildings Except Low-Rise Residential Buildings**

Date Approved: April 9, 2011

Request from: Harry Misuriello (misuriello@verizon.net), Arlington, VA.

Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IES Standard 90.1-2010, Section 6.4.4.1.3 Piping Insulation, relating to pipe insulation requirements in Table 6.8.3A and Table 6.8.3B.

Background: Section 6.4.4.1.3 Piping Insulation, Table 6.8.3A and Table 6.8.3B provide piping insulation requirements for heating and cooling fluids in certain temperature ranges and provide exemptions under certain circumstances.

Interpretation: The exceptions for pipe insulation make it so most water source heat pump system are excepted from pipe insulation due to the 60°F to 105°F exception. When the system gets designed as a ground source heat pump system, the temperature generally ranges from about 40°F to 105°F or 110°F. At first glance it might seem that insulation is required. However, the 40°F occurs at heating design, and is below the lowest water temperature in Table 6.8.3A. The 110°F occurs at cooling, and is above the highest water temperature in Table 6.8.3B. So the letter of the standard would not require insulation on the pipes.

From an intent standpoint the 110°F water would likely cool as it moves through the building, reducing the water temperature to the heat pump and making it more efficient in the cooling mode. The 40°F water would likely warm as it moves through the building, increasing the water temperature to the heat pump and making it more efficient in the heat mode. So I think that in a ground source heat pump system, whether using the letter or the intent, that pipe insulation would not be required.

Question: Is this interpretation correct?

Answer: Yes.

Comments: The situation described in the request as described above falls under Section 6.4.4.1.3 Piping Insulation and the following exception in that section: "d. Where heat gain or heat loss will not increase energy usage (such as liquid refrigerant piping)." Therefore the ground-source heat pump system piping would not require insulation under the conditions you describe. In addition, the heating and cooling water temperatures you state are outside the fluid temperature ranges in the referenced tables. Your interpretation is correct.