

Monday, December 19, 2016

Steam Humidifier Distribution Panels for Short Absorption: Humidification Basics (Part 14)

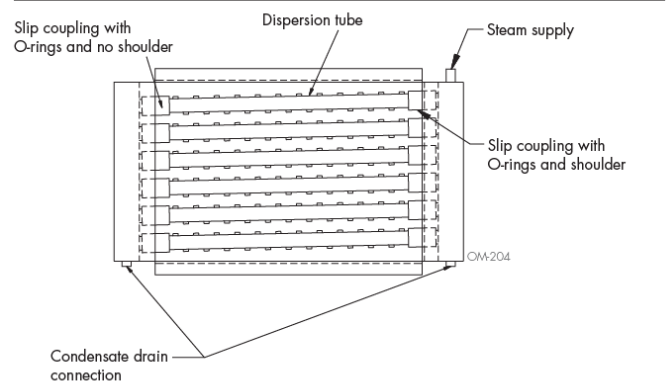
Last week, we reviewed [different types of steam humidifier distribution methods](#), which are inexpensive but have longer absorption distances. Many HVAC installations require very short absorption distances. Humidifier distribution panels provide solutions to this requirement. This week we'll review the options for these dispersion methods.

Ultrisorb Panel Style Dispersion Choices for Steam Humidifiers

Dri-steam offers a variety of panel-style distribution options to add humidification steam into ducts. These are all branded as Ultrisorb panels, but there are differences between them.

Once in a while the job conditions require the dispersion tubes in a vertical duct. The air flow direction moves straight down from an AHU through the duct. In this case, you would need an Ultrisorb LH with the horizontal tubes. This application is only available with non-pressurized humidifiers such as the electric gas or steam-to-steam units.

FIGURE 11-3: ULTRA-SORB MODEL LH



If the air flow is horizontal, whether in the AHU or in the ductwork, there are a number of panel style choices, based on capacities and cost.

Dri-steam Ultrisorb MP provides capacities up to 2720 PPH and is the lowest installed cost choice for the engineer to specify. The panel, unless very large, is normally shipped

assembled and includes the headers. The steam supply and return are on the same side. These benefits reduce the installed cost. This lower installed cost panel is also available with high efficiency tubes as an option.

Dri-steem Ultrasorb LH and LV panels offer capacities up to 4000 PPH. The choice of horizontal or vertical tubes depends on the configuration of the duct and the downstream absorption distance required. Your sales representative can assist you in the selection. This middle-of-the-road first-cost panel is also available with high-efficiency tubes as an option.

The feature rich Dri-steem Ultrasorb XV carries a higher cost, but it's loaded with value. The humidifier is shipped assembled unless dimensions exceed 98" or as requested. This panel comes standard with high-efficiency tubes, which reduce the number of tubes required and the heat gain to the air. The XV has an internal heat exchanger to allow low-pressure condensate to be returned to the boiler without the need of a condensate pump. This unique panel has two steam inlet connections and is ideal for use with pressurized steam or steam-to-steam humidifiers.

Why Specify High-Efficiency Tubes?

Steam humidifiers are used most often in institutional and larger commercial buildings. One key drawback is the heat gain to the air in the duct.



ULTRA-SORB MODEL MP
Lowest total installed cost



ULTRA-SORB MODEL LV/LH
Unmatched capacity and versatility



ULTRA-SORB MODEL XV
Integral condensate management

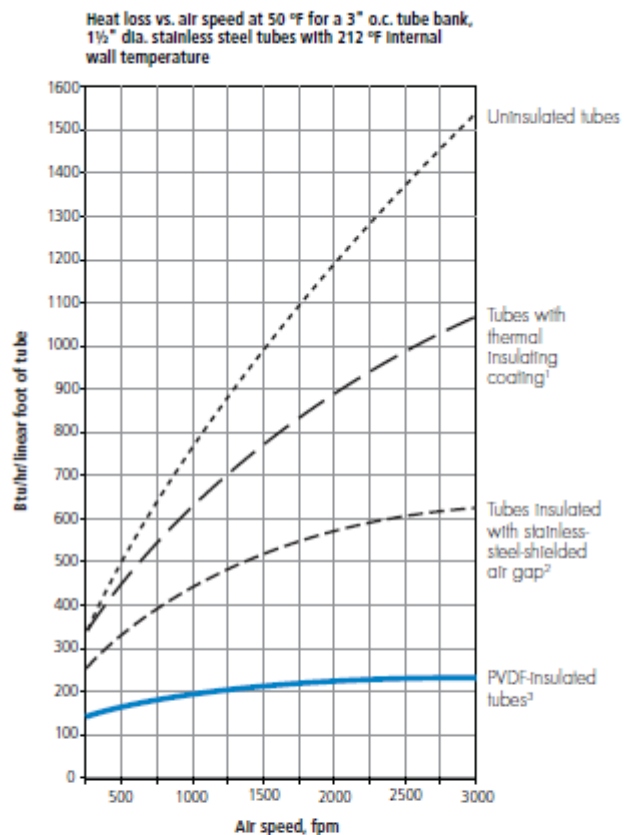
Most manufacturers of panel-style humidifiers provide insulation on the tubes as an option.

What’s the difference between standard insulation and high-efficiency insulation? Standard insulation on humidifier tubes may be ceramic-coated with a thermal insulated coating known as TIC, or stainless steel shielded with an air gap. The high-efficiency PVDF insulation option has an “R” value over three times that of these other standard tubes. This reduces wasted energy and condensate up to 85%.

You can read more about [insulation and the effect on operating costs](#). (This chart was taken from that article.)

Next week we’ll conclude the humidification series with a discussion about condensate handling.

FIGURE 6-1: DISPERSION TUBE HEAT LOSS



Notes:
 Heat loss calculations based on: Kakac, S., Shah, R.K., and Aung, W. (Eds.). (1987). Handbook of single-phase convective heat transfer [pp. 6.1-6.45]. New York: John Wiley & Sons.
 1 Tube with thermal insulating coating has a 0.030" thick spray-on coating with a thermal conductivity of 0.0561 Btu/h•ft•°F and an R value of 0.045.
 2 Stainless-steel-shielded air gap ranges from 0 to 0.25" (1/4") thick, has an average thermal conductivity of 0.108 Btu/h•ft•°F, and an average R value of 0.16.
 3 PVDF insulation on tube is 0.125" (1/8") thick, has a thermal conductivity of 0.0185 Btu/h•ft•°F, and an R value of 0.56.