

Should I insulate my condensate units' receiver?

The answer to the question "Should I insulate my unit?" is not a simple one. The decision has to be based on proper application of products in the system, understanding their strengths and limitations, and evaluating the system design for application as well as serviceability.

ITT Domestic Pump and ITT Hoffman Pump products do not specifically address this issue in our literature, nor is there a factory recommendation in our product application and sizing guides for steam systems and design classes taught in the Little Red School House. Whether insulation should be applied, is a matter of choice based on the system design. However, there are some general concerns regarding the application of insulation to condensate handling / boiler feed equipment that should be considered before applying insulation. Our concerns are based on a numerous sight visits to customers' installations and comments we receive from the field.

Does adding insulation really save money and improve performance?

The application of insulation is usually done in order to retain as much of the latent heat from the condensed steam as possible. In this way energy costs associated with creating new steam in the boiler are reduced by minimizing the energy required to create steam in the boiler. But consider this. The majority of the Domestic Pump / Hoffman Pump condensate units have cast iron receivers which are sized, per current ASHRAE recommendations, for one minute net storage on condensate receivers or 5 minute net storage on boiler feed units. Thus, if the unit is properly sized, condensate is collected and returned to the boiler in timely manner, before too much additional sub-cooling can occur. The thermal mass of cast iron receivers retains heat. In the event that of a steam trap failure, the walls of the condensate receiver and the vent piping allow the steam to condense as additional heat from the failed trap is dissipated. Adding insulation can work to negate this and may not allow sufficient cooling of the condensate in order to prevent pump performance problems due to NPSHA issues. Properly sized units and understanding the dynamics of the complete system can often be more economical than grossly over sizing units and applying insulation.

Adding Insulation may impede service of the unit

Insulation is often field constructed in a manner that restricts access to the product. This compounds future service issues when the insulation has to be removed to access the product for maintenance. Replacement parts for Built-To-Order Domestic Pump products and Hoffman Pump products are keyed to the unit serial number., Application of insulation may hide identification plates, making parts identification problematic without removal of the insulation. Removing the nameplate from the unit and locating them outside of the insulation may result in the loss of the data plate, thereby creating problems in identifying the unit and obtaining correct replacement parts. If the data plate is removed, then the issue of loss of its data is increased, depending on who removes the data plate and where it is relocated.

Insulation can trap moisture

Insulation may trap moisture from the atmosphere, or moisture as a result of service issues, against the receiver. Moisture trapped next to a receiver may accelerate corrosion issues which will shorten the product life. Cast iron receivers are certainly subject to this, and fabricated steel receivers see even greater acceleration of problems. As data plates are seldom removed and relocated before insulation is applied, any corrosion under the insulation may also quickly corrode data plates and render them unreadable, thus doubly compounding the parts issue noted above. Furthermore, when moisture is trapped under the insulation in a warm, damp environment, there is the possibility of creating molds, which thrive in warm, moist environments. Health issues associated with long term exposure to mold environments are starting to be recognized and industry solutions have not been completely defined. In order to prevent mold creation, the solution appears to be leaving the condensate unit uninsulated and installing condensate units in a properly vented and drained equipment space.



Never insulate vacuum units

Lastly, we have to talk about systems where vacuum is applied in order to remove air from in front of the steam in the system and to provide lower steaming temperatures. Vacuum heating units have lower temperature limitations. They are typically designed to operate at 160 degrees F or cooler. System problems occur when steam traps fail and steam passes through the trap to the vacuum heating unit. We never recommend insulating vacuum units. Maintaining traps on vacuum systems is very important. But when a steam trap failure occurs, the uninsulated condensate unit can help in cooling condensate to acceptable levels. This cooling helps to protect or at least minimize damage to vacuum heating unit until the trap can be repaired. These units should always be un-insulated in order to allow for the best heat retention vs. heat dissipation relationship in the equipment.

The decision to insulate a condensate or boiler feed unit is dependent on many factors and only you can determine if it is best for your situation. But when deciding, take a moment to review the information above and make an educated and informed choice for you and your customer.