

**REPLACE EXPENSIVE REHEAT
FOR ENERGY SAVINGS**

SOLVE HIGH HUMIDITY PROBLEMS

DHP-S™ Site Installed Wrap Around Systems



PHARMACEUTICAL FACILITIES



UNIVERSITIES



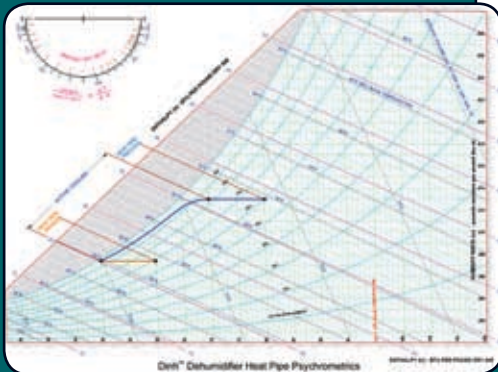
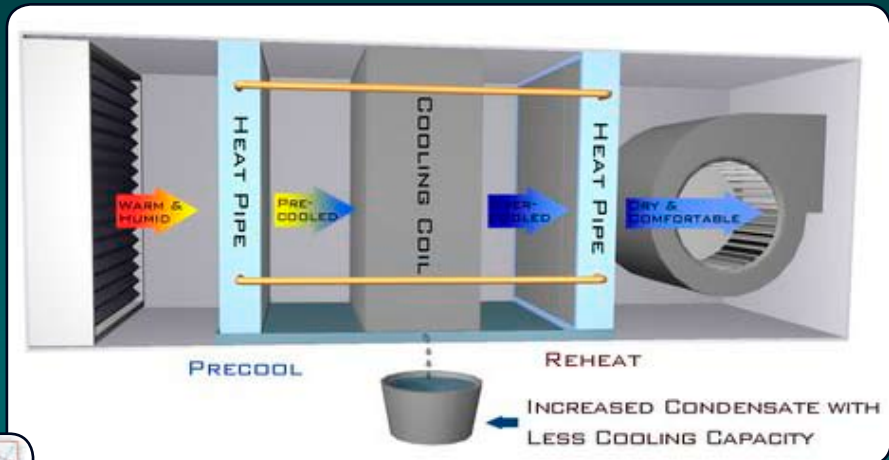
INDUSTRIAL LABORATORIES

DHP-S™ Site Installed Wrap Around Systems are compact and highly efficient heat transfer devices designed to provide both free cooling and reheat in applications where both the temperature and humidity must meet requirements as well as solve high humidity problems.

DHP-S™ Site Installed Wrap Around Systems

THE PRINCIPLE

Heat pipes are thermal transfer devices capable of moving large amounts of heat energy - from the incoming air stream to the supply air stream in A/C units. The dehumidifier heat pipes consist of two sections, the precool (evaporator) section placed before the cooling coil and the reheat (condenser section) placed after the reheat coil.



As hot incoming air passes over the precool coil, the liquid refrigerant vaporizes, absorbing heat from the air stream, thus lowering its temperature. This allows the cooling coil to run at a lower temperature. As a result more condensate is removed. Vaporized refrigerant then moves through connecting tubes to the reheat section downstream of the cooling coil, where it condenses, warming up leaving air and reducing its relative humidity.

THE PROBLEMS

In addition to the standard temperature control of a space, many applications require control of the humidity. The historic and well-understood solution to that requirement is to over cool the air to meet the humidity and then reheat to meet the temperature. But that approach burdens the owner with high energy costs.

Other applications not using reheat have a mismatch between the Sensible Heat Ratios of the load and the equipment, resulting in the space humidity being too high. Typically, the mismatch is worse at part load conditions.

THE INNOVATORS

Twenty-five years ago, Heat Pipe Technology invented the use of heat pipes wrapped around a cooling coil to save energy and increase the latent removal capacity of any air conditioning system. In addition to installing these heat pipes at the HPT plant and selected manufacturing partners, the heat pipe systems are also installed in AHUs already installed in the field.

THE SOLUTION

Wrap Around heat pipes solve both types of problems, either by replacing or minimizing the expensive reheat with heat pipes, or reducing the Sensible Heat Ratio of the equipment. The heat pipes fit totally inside the AHU and are easily controllable if needed. One strategy is to "oversize" the heat pipes at design conditions but modulate their effect, and then allow them to operate more fully at part load conditions. This will maximize the overall energy savings.

THE PROCEDURE

1. Contact Heat Pipe Technology (HPT) or your sales representative with a description of the system
2. If HPT can help, HPT will provide a budget proposal subject to a site survey
3. If the customer wants to proceed, a nominal survey fee is charged refundable after
4. Under the direction of a Licensed Professional Engineer, HPT inspects the units, studies the technical aspects of the customer's systems and controls, and determines the project's requirements. The survey requires entering the AHUs and numerous measurements.
5. The customer and HPT work together to determine the time for the installation to take place. This may include working holiday hours, only at nights or other unusual aspects.
6. The final comprehensive proposal complete with technical performance data and the conditions of the work is submitted to the customer for final acceptance.
7. The work is then performed totally by HPT employees and the customer receives the benefits.



SPECIFIC APPLICATIONS

- 100% Outside Air Systems and mixed air AHUs
- If replacing reheat, the reheat is already installed in the AHU or in at least part of the supply ductwork
- Multizone AHUs
- 5,000 – 100,000 CFM units
- One to any number of units
- Chilled Water, Brine and DX Systems

HOTEL/RESORT CASE STUDY

Problem:

Like many hotels in humid climates, a Hotel Resort in Florida relied on electric heat strips to warm their over cooled outside air before discharging it in the hallways. Heat strips use expensive energy.

However, turning electric heat strips off would result in cold, clammy conditions that are conducive to mold and mildew.

Solution:

Heat Pipe Technology surveyed outside air units at the Resort, then made heat pipes systems to fit the existing units. HPT crew worked closely with hotel staff to minimize disruption to hotel guests during this field installed project.

The costly heat strips were immediately turned off resulting in \$300,000 annual savings and a simple payback of under One year! Six months later, five more units were retrofitted and more are on the way.

"Heat Pipe Technology has not only met our expectations, they have far exceeded them."

*- Hotel Director of Engineering
Orlando Resort*

PERFORMANCE CONTRACTS

HPT sometimes performs this work as part of a much larger performance contract. The heat pipe results may be measured and verified, and HPT can provide guidance on how most effectively to do this.

DHP-S™ Site Installed Wrap Around Systems



FEATURES & BENEFITS

- ◆ Copper tubes and copper or aluminum fins
- ◆ Galvanized or Stainless casings
- ◆ Variety of coatings for protection against corrosion
- ◆ HFC heat transfer fluid for long term environmental protection
- ◆ Multiple circuits for reliability and redundancy
- ◆ Most compact design, which is especially important for field installations
- ◆ Highest effectiveness and lowest airside pressure drop for maximum energy savings
- ◆ No moving parts for increased reliability and less maintenance

APPLICATIONS

Some of the Industries That Have Site Installed Wrap Around Heat Pipes

- ◆ Pharmaceuticals
- ◆ Hospitals
- ◆ Hotels/Motels
- ◆ Libraries
- ◆ Museums
- ◆ Supermarkets
- ◆ Factories
- ◆ Military Bases
- ◆ Restaurants
- ◆ Schools
- ◆ Swimming Pool Enclosures
- ◆ Print Shops
- ◆ Office Buildings
- ◆ Laboratories
- ◆ Archives
- ◆ Health Care Facilities
- ◆ Film Processing and Drying
- ◆ Clean rooms

Pharmaceutical Retrofit Case Study

A pharmaceutical manufacturer in North Carolina had chilled water and hot water reheat coils mounted in AHUs and controlled to maintain space temperature and humidity requirements. Seven AHUs were fitted with heat pipes. One AHU had 38,000 cfm (10% outside Air) and maintained 54 F air off the coiling coil with 8 F reheat. Heat pipes were custom designed for 5.2 F of reheat at design conditions with the existing reheat coil trimming to maintain setpoint. With an inhouse cogen plant, the client internally used \$0.03/kwh and \$0.57/therm utility cost and had a central chilled water plant at \$0.90 kw/ton including condenser and AHU fans and pumps. From a BIN analysis, the result was over \$12K in annual savings with payback of under 2.5 years. The following year six more AHUs were site fitted with dehumidifier heat pipes.



**Heat Pipe
Technology, Inc.**

ADVANCED DEHUMIDIFICATION & ENERGY RECOVERY

4340 NE 49th Ave., Gainesville, FL 32609

(352)367-0999 Fax: (352)367-1688

E-mail: heatpipe@heatpipe.com

www.heatpipe.com

CONTACT US TODAY!

Learn how our
**DHP-S™ Site Installed
Wrap Around Systems
can help qualify
your next project to
be U.S.G.B.C.
LEED Certified.**

**LEED for Existing Buildings
Dehumidifier Heat Pipe Retrofits
and LEED Credits**

- ◆ Optimize Energy Efficiency Performance, EA Credit 1.1
- ◆ Refrigerant Management, EA Credit 5
- ◆ Innovation in Operations, IO Credit 1.1