AIR MANAGEMENT TECHNOLOGIES, INC.
Building Energy & Environmental Services
1776 Industrial Blvd. ▪ Lewisburg, PA 17837
Phone 570-523-4822 ▪ Fax 570-523-2048
www.airmanagement.com

Call us today at
1-877-PICK-AMT

Commercial/Industrial Bakeries **Volume 1, May-June 2011**

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OSHA Heat Stress Manual
How to determine and address heat stress issues.

http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html

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http://www.airmanagement.com

scott.houtz@airmanagement.com

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Industrial Heat Pump Energy Savings

Commercial Bakeries have the potential to reduce energy cost significantly by incorporating industrial (fluid to fluid) heat pump technology into process operations. Most of us are familiar with Geothermal heat pumps that provide one of the most efficient means for space heating and cooling by extracting heat from the earth as its energy source. Similar technology is available for many process applications, even with increased efficiencies above geothermal and at an affordable cost.

Lets look at an example of how this technology can be applied in a Commercial Bakery through process to process by extracting heat to produce chilled water (cooling) while simultaneously providing heating for service water, boiler feedwater, heat tracing, etc. It's like getting "free" chilled water or water heating depending on how you look at it. Some models can produce temperatures in excess of 190°F, while simultaneously providing low temperature glycol and also use environmentally friendly refrigerants including CO2 and ammonia. Each application is different and we would be glad to assist in selecting the best model and design to meet your requirements. Normal financial return on investment (ROI) is less than 4-years when retrofitting existing systems and when incorporating in a new installation or capital is allocated to replace equipment the return can be substantially less.

Human Heat Stress

Summer will soon be upon us "officially" and for those of us that have endured a long cold winter in the North East the warmer temperatures are a welcome change. Unfortunately the warmer temperatures outdoors lead to increased temperatures inside our plants and measures need to be considered to maintain ventilation requirements for both occupants and product cooling applications.

We are many times asked how many air changes per hour are required to maintain an acceptable comfort level, and the answer unfortunately isn't that straight forward as it depends on many factors including the climate, internal heat gains, activity levels of occupants, etc. all while maintaining the proper space pressurization and filtration requirements. Occupational Safety and Health Administration (OSHA) has published guidelines that address some of the heat stress requirements and you may be surprised to find that 70% of the calculated requirements don't have anything to do with space temperature, but more with the humidity levels that have a great impact on how we regulate our body temperature. Wet Bulb Globe Temperature (WBGT) is a commonly used measurement for heat stress and is determined by an instrument that measures space air temperature with radiant heat inclusion so that areas near ovens and other radiant sources are captured, as well as the wet bulb temperature (rate of evaporation) and through a series of calculations an acceptability rating can be

	established.