Air Management Technologies, Inc.
Building Energy & Environmental Services

FoodTherm INC.
Food Process • Thermal & Energy Solutions

Proofing Environmental Systems

Guaranteed Solutions:

Process Cooling

- Mixer & Sponge Systems
- Chilled Ingredient Water
- Finished Product Cooling
- Blast Freezing
- Refrigeration

Process Heating

- Water Heating
- Steam & Hot Water Systems

Environment Conditioning

- Proofing/Retarding
- Spiral (Finished) Products
- Oven Steam
- Mold & Particulate Control

Industrial HVAC

- Makeup Air Systems
- Spot Cooling
- Space Pressurization
- Filtration
- Mechanical Cooling
- Ventilation

Waste Heat Recovery

- Ovens & Oxidizers
- Solar/Fuel Cells
- Compressed Air
- Industrial Fryers

Specialized Technologies

- Absorption Refrigeration
- Cascade Refrigeration
- Industrial Heat Pumps
- Solar/Fuel Cells
- Organic Rankine Cycle

Commercial and Industrial Bakeries understand time and a properly controlled environment are essential factors that must work together for the proofing process to achieve consistent dough development. In the baking industry space temperature and humidity set points are commonly referred to as "dry heat" and "wet heat". These two set points will vary widely depending on the product type and desired proofing objectives. Environmental systems must maintain close tolerances regardless of external temperature and humidity conditions to meet requirements for product quality.

Common energy sources used to supply "dry heat" coil heat exchangers include steam, hot water, oven heat recovery, and electric resistance. "Wet heat" is delivered to the proofer through direct and indirect steam vaporization, and adiabatic water atomization through a dispersion grid or direct spray. Control measurement historically and still found in some bakeries today is a single point "wet bulb" condition measurement which turns on and off heat and humidification systems. This single measurement in some ways simplified the process, modern measurement techniques utilizing the combination of monitored dry bulb space temperature and relative humidity percentage coupled with properly engineered control sequences have significantly tightened condition tolerances reducing energy waste while improving product quality.

Air Handling System

Typical proofer environmental equipment consists of an air handling system incorporating several components designed to control space temperature, humidity, and air movement. Proofer environmental systems can be designed with the air handling units installed either directly inside the proofing space or exterior to the enclosure.

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Placement outside the enclosure provides ease of maintenance, decreased sanitation requirements, and dependent upon plant conditions may allow a less corrosion resistant exterior. Conversely inside the enclosure provides energy and installation cost saving benefits. Where high humidity proofing requirements exist an internal installation may be compulsory to prevent condensation and potential for mold growth inside the distribution ducting when plant conditions are below dew point. Air distribution ducting and any components directly subject to the proofing environment should be constructed of corrosion resistant materials and in most cases stainless steel is recommended. The primary exceptions are the "dry heat" coils where stainless steel provides great corrosion resistance but poor heat transfer performance. For this reason "dry heat" coils are typically constructed from copper as a compromise material balancing performance, longevity, and cost.

System air distribution design in larger proofers is typically engineered to support natural air flow tendencies - hot air rises. Supply air is introduced at a low level above the floor and returned through ducts near ceiling level with a sufficient amount of air exchanges to decrease stratification potential. Design ranges of twenty to forty air changes per hour additionally reduce the impact of the supply air exceeding proofer conditions by possibly 40 degrees or more under full production load. This is not to say "bigger is always better" with air exchange rates as excessive airflow can damage product. With variations on production lines it is recommended supply fans be equipped with variable frequency drives to allow airflow adjustment ensuring product quality and reducing energy waste. Also recommended is incorporating a "rapid purge" fan to evacuate hot air from the proofer allowing maintenance staff faster and safer access for repairs and expedite product changeover.

Sustainability & Cost Saving Benefits

About Us

Air Management Technologies has delivered energy, thermal process conditioning, and environmental solutions for over twenty years. Our written performance guarantee places the responsibility in our hands and the life cycle benefits in yours. Cost conscious decisions are made with the customer in mind and every project is guaranteed to operate as specified.

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