



CASE STUDY

Closed Loop Liquid Cooling of Electronics Reduces Downtime, Maintenance & Repair Costs for Commercial Bakeries

Pfannenberg provides custom enclosure cooling solution for one of the fastest growing independent, family-owned wholesale bakers in America.

Since 1906, families across the United States have been asking for Schwebel's breads by name. Known for their fresh, outstanding taste, and superior quality bread; Schwebel's has maintained their strong reputation. They have grown into a company proud to serve customers with various bread product lines.

Flour is one of the paramount enemies of electrical enclosures and enclosure air conditioners, particularly in the make-up area of a commercial bakery.

The "make-up" area, also known as the dough preparation area is the area within a commercial bakery that contains the greatest combination of flour, moisture, and heat. When the flour becomes wet (due to the ambient humidity levels) it forms a paste-like consistency. It is this build-up of flour and paste within the air conditioner that leads to reduced performance and failure. Without this proper cooling there is added stress and risk of failure for the variable frequency drives (VFDs) and enclosure electronics, leading to costly repairs and downtime.

For over 100 years, the Schwebel Baking Company has been one of the fastest growing independent, family owned baking manufacturers in the United States. This family run business was founded by Joseph and Dora Schwebel and their family bread recipe. The Schwebel's began baking bread in their home kitchen. Known for a fresh, outstanding taste, and superior quality bread, the reputation of their bread flourished.

The Schwebel Baking Company has maintained competitive advantage by implementing new trends in the marketplace. The organization continues to instill pride in their product; meeting the nutritional and flavor requirements of customers they serve.

Today Schwebel's produces more than 700,000 loaves of various breads at their 4 baking facilities and 30 distribution centers in New York, Ohio, Pennsylvania, and West Virginia. Schwebel's provides various branded breads to retail and foodservice customers. Schwebel's mission for distinction has continued throughout the years as a result of the Schwebel family's high standards and individual responsiveness to every product and customer account. Schwebel's sought out Pfannenber in assistance of solving problems and optimizing their resources.



Fig. 1: Previous competitor cooling equipment

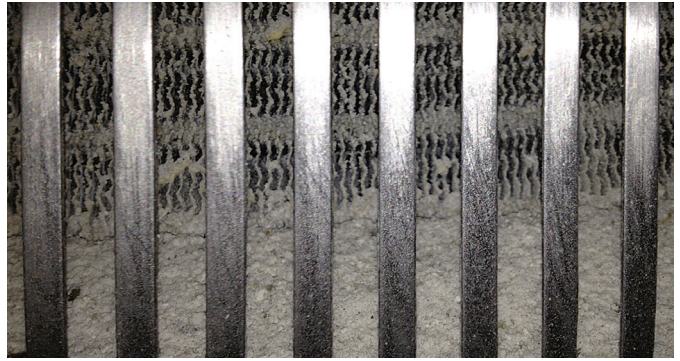


Fig. 2: Flour and dust buildup inside their previous competitor unit

Challenges:

The electronics cooling "sweet spot" is between 85°F - 95°F. Any temperature lower is in danger of condensation which could lead to water forming on the electronics, anything higher can cause heat stress failure on the equipment. It is imperative that electronics get the proper cooling solutions.

With manufacturing space in high demand, machine bundles have become smaller and liquid cooling has emerged as the most efficient and economical means of eradicating heat from enclosures. Liquid cooling is especially well adapted to hot, dirty environments where it provides a method of removing the heat from the machines. This liquid cooling method is an ideal solution for the makeup area in a commercial bakery.

Many commercial bakeries still use air conditioners to cool their electronics in the make-up area because they are a convenient means of effective closed-loop electronics cooling. This is not a sustainable solution due to the high concentration of particulate in the air, ultimately leading to clogged air conditioners that fail. As an internal solution to this problem the doors to the enclosure are opened to provide the needed cooling, allowing dust into the cabinet, doing more damage by compromising the NEMA 4/4X environment. The proposed water solution provided by Pfannenber is often the only method of providing sustainable, efficient, and reliable performance in such environments.

How the PWS Series Air/Water Heat Exchangers Helped

Pfannenberger's PWS Series Air/Water Heat Exchangers were an ideal solution for the Schwebel Baking Company – trouble free cooling of their electrical enclosures in areas with high amount of dust, moisture and flour in the air. The PWS Air/Water Heat Exchangers utilize glycol or a cool water source that is already available in the factory, to cool their electrical units.

By installing Pfannenberger's Air/Water Heat Exchangers, Schwebel's was able to see a big difference in the cleanliness of their electrical cabinets. Pfannenberger's Air/Water Heat Exchanger has no filters, which means there is no down time trying to change filters or having them becoming clogged.

Not only were their electrical enclosures cleaner and required less maintenance, there was also a big difference in the efficiency of the cooled air. In the past, most of their AC units would cool the enclosures, but because their filters would get clogged with airborne particles, the stability of the cool air was not present. Pfannenberger has been able to provide the proper solution to keep the electronics cool and at a stable temperature, regardless of the environment.



Fig. 4: Pfannenberger's PWS unit installed on enclosure

The Aftermath:

Pfannenberger implemented 4 PWS-3202 Air/Water Heat Exchangers at the Youngstown, Ohio Schwebel's facility in their Make-up area. There are energy savings when integrating a PWS Series Air/Water Heat exchanger. There are no compressors which reduce the energy usage and they tap into already existing water/glycol lines that run throughout the plant.

The additional benefits that Schwebel's obtained:

- Reduced maintenance costs
- No filters - eliminated the risk of having a clogged system
- Prevent unplanned repairs
- Uses less energy - costs reduced



Fig. 3: Pfannenberger's Stainless Steel PWS Unit

The company's product, equipment, and employees are integral to Schwebel's operation. Schwebel's has spent many years building their strong reputation in the marketplace and with their customers; this is a top priority. Pfannenberger and Schwebel's have developed a strong relationship. Schwebel's has raved about the products and are beginning to implement more Pfannenberger products within their facility; such as installing Pfannenberger's PA X-1-05 Flashing Light Sounders.

Pfannenberger products and solutions are designed to meet high quality requirements and operate in the harshest of conditions. Pfannenberger continues to strengthen its position as a leader in providing plant wide protection of electronics and personnel.

Summary

Keeping the electronics cool which power the machines, is essential to the entire operation of the Schwebel Baking Company. Without the electrical enclosures staying cool, the machines fail and require replacement or downtime for repair. Inside a baking facility, there is lots of dust/flour throughout the air and can clog the operating machines.

Pfannenberger's PWS Series Air/Water Heat Exchanger was the precise solution for Schwebel's complications. Incorporating the Air/Water Heat Exchanger improved performance, reduced maintenance, was energy efficient, and prevented unplanned repairs.