



World leaders in the science of heating and cooling bulk solids.

# CASE STUDY

## A Better Solution For Cooling Sugar

Danisco Sugar, Köpingsbro, Sweden

Danisco Sugar is the fourth largest sugar producer in Europe. From 1997-2000, the Danisco plant located in the small town of Köpingsbro in the south of Sweden increased its capacity by 40 percent, producing 85,000 kg/hr of granulated sugar. With the increased rates, Danisco found that the cooling capacity of their existing equipment was no longer sufficient to meet their needs. The sugar temperature had increased to approx. 35-40°C which created a problem since the recommended temperature to prevent caking and maintain product quality in storage is below 30°C.

Until then, the traditional ways of cooling sugar included drum coolers or fluid bed coolers that use large amounts of air and energy to provide the necessary cooling. The engineers at Danisco were on the lookout for a more cost effective solution and decided to evaluate the Solex Heat Exchanger. This technology had just been introduced to the sugar industry after many years of cooling other types of free flowing bulk solids such as plastics, detergents, fertilizers and chemicals.

The Solex Heat Exchanger operates by combining mass flow with conventional heat exchanger technology. Instead of air, the exchanger uses cooling water passing through welded, hollow stainless steel plates. The vertical configuration provides for a large heat transfer area in a compact unit, making for a very efficient design. This indirect method of heat transfer eliminates emissions and there is no need for fans, scrubbers or other costly air-handling equipment. Unlike other methods used for cooling bulk solids, the Solex Heat Exchanger has few moving parts and no large horsepower drives.

An on-site pilot test was carried out at the plant in November of 2000, and after two weeks of positive trials, the management, engineering and maintenance departments of Danisco fully endorsed the selection of this equipment for their plant. The Solex sugar cooler was started up successfully in time for the next sugar campaign starting in September 2001. At the completion of the sugar campaign, Danisco submitted a report with the following conclusions:

**INSTALLATION COSTS:**

Compared to fluid bed and drum coolers, the investment cost for the installation was much lower. The equipment is compact and is easy to install.

**COOLING PERFORMANCE:**

At full capacity, Danisco found that the equipment met or exceeded the expected cooling duty, cooling 85 mtph of sugar from 40°C to 25°C with cooling water supplied at 16°C.

**PRODUCT QUALITY:**

Product quality was maintained or improved by the equipment, and there was no generation of fines that would be expected in other cooling equipment.

**MAINTENANCE AND OPERATION:**

Danisco found that the Solex cooler had very low maintenance and operating costs because there are few moving parts, and the equipment was simple and easy to operate.

**NO EMISSIONS:**

Since the equipment does not use any air to cool the sugar, there are no emissions to deal with.

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