

Assembly in Korea at breathtaking speed

Disassembly of the existing equipment, installation of the new sugar drying plant, and test runs took a mere 22 days!

In December 2005, BMA installed and successfully commissioned a sugar dryer / cooler for the Cheil Jedang refinery in South Korea. The system is designed for a total throughput of 60 t/h of refined sugar. The equipment supplied by BMA includes a drum dryer (Ø 2,800 x 9,000 mm), a fluidized-bed cooler (1,600 x 5,000 mm; 4 zones), and peripheral equipment such as fans, conveyors and heat exchangers.

The factory's earlier processing system with a combined drum dryer / cooler had no longer been able to meet the market requirements regarding sugar quality and sugar outlet temperature. This is why the customer decided to install a new plant.

Owing to the countercurrent principle used in the drum, BMA's new sugar drying and cooling concept offers ideal conditions for effective drying of the moist sugar crystals after centrifugation.

The cooler makes use of the fluidization principle. In a bed of fluidized sugar crystals, almost the entire surface of the product comes into contact with the cooling air, thus providing for intensive heat transfer. This benefit is further enhanced by cooling tubes integrated for effective discharging of the heat released by the product.

Another advantage of the BMA concept is the energy saving effect achieved by recirculating the entire exhaust air of the fluidized-bed cooler to the drum and re-using it for drying. This air is heated by the sugar in the cooler to temperatures required for drying and therefore need not have to be heated separately. Heated air is blown directly into the wet-sugar section of the drum through a central tube only. As this reduces the drying energy at the rear end of the dryer, the sugar is dried much more gently. This not only improves the product quality, but also helps reduce the temperatures at which air has to enter the dryer.

By re-utilizing the air leaving the fluidized-bed cooler, the overall air requirements of the complete system can be cut by more than half. In addition, the interaction of convective cooling and contact cooling, which is made possible by integrating cooling tube bundles into the fluidized-bed unit, reduces the air requirements to levels that remain by far below those of conventional systems.

Because it is re-used in the drying drum, the exhaust air of the fluidized-bed cooler need not be freed from dust. This provides for additional savings in that the total fan power installed for outgoing air can be reduced, and less floor space is required for the fans.

Plant operation has been automated to such an extent that operator intervention can be limited to routine inspections. A separate control circuit ensures that the sugar outlet temperature is maintained at a constant set-point temperature of 30 °C.

Carsten Klemp

Fluidized-bed cooler with feed lock

