

OVC for low-raw sugar – Follow-up order for the STAR TRADING refinery, Nigeria

In BMA Information 49/2011, we reported on an order for centrifugals from STAR TRADING, Nigeria, comprising 10 batch-type and four continuous centrifugals including 10 related discharge flaps and five distribution mixers for the new “Golden Sugar Refinery” in Lagos. All these equipment items were shipped on schedule in June 2011.

In May 2011, BMA then received an order for the complete delivery of a vertical cooling crystalliser (OVC) for low-raw sugar with a throughput of 10 t/h. Additional equipment such as switchgear and control cabinet, a rotary pump, a plate heat exchanger and a balancing tank for cooling water circulation also form part of the scope of supply.

The OVC is used for de-sugaring low-raw product in beet and cane sugar factories, but also in larger sugar refineries. The molasses arising in refineries as centrifugal syrup from the last crystallisation stage still has a substantial share of sugar, part of which can be recycled in an OVC. Since the price of sugar is considerably higher than that of molasses, the investment cost of an OVC pays off very quickly – as shown by the calculation below.

Economic efficiency of an OVC in refinery operation

Massecuite capacity	10 t/h
Costs	€ 700,000
Massecuite inlet temperature	70 °C
Massecuite outlet temperature	45 °C
Reduction of syrup purity in OVC	38.3 % → 33.7 %
Additional sugar yield	5 t/campaign
Operating days	350 d/a
White-sugar price	€ 600/t
Additional revenue by OVC	€ 989,000/a

Unlike vacuum pans for A, B, and C product, where crystallisation takes place by means of water evaporation under a vacuum, vertical cooling crystallisers use cooling water to slowly and evenly cool down the massecuite from the C product vacuum pans. During this cooling process, no new crystals are formed, but the existing crystals grow

and thereby bond part of the sugar contained in the molasses. The main advantages of the BMA cooling crystalliser are that it operates without stirrers. The cooling blocks installed are slowly lowered and lifted again by about 1 m by means of hydraulic cylinders. This allows for a reduction of the crystallisation temperature down to 40 °C, resulting in a very high viscosity of the massecuite. The lower the crystallisation temperature, the higher the sugar yield from the massecuite.

When using stirrers, such low temperatures and thus high recovery values cannot be achieved, since the high viscosity would result in an overloading of the stirrer gear motors. In addition, the use of stirrers is associated with high wear of spare parts for ball bearings, stuffing boxes, gear motors, etc., which is only rarely the case with hydraulic cylinders as used by BMA.

Bernhard Schmidt

Loading at the workshop
in Braunschweig

