

AT NESTLÉ

On the fast track to chocolate pralines



Today, chocolates, chocolate bars and a variety of pralines are manufactured industrially. Nevertheless, the process of making chocolate demands considerable know-how and can only be carried out efficiently using modern systems. Innovative manufacturers – such as Nestlé AG – use, for example, the double screw pump from KNOLL Maschinenbau, Bad Saulgau, to plasticise large blocks of chocolate.

After adding cocoa paste, cocoa butter, powdered milk and sugar, the mix is heated to a temperature of over 40 degrees and then slowly cooled to give the chocolate its delicate smoothness, smooth texture and shelf stability. At Nestlé, the chocolate is poured into blocks measuring 500 x 300 x 150 mm and stored in a cooling room at 12°C before being processed into various chocolate fillings.

To be able to mix this chocolate paste with nuts, raisins or other ingredients, the hard blocks must first be softened. In the past, they were stored in a warming room for several days at 28°C for this purpose. They could then be blended with other ingredients in a mixer, homogenised and, finally, fed into the extruder for final processing into pralines etc.

Double screw pumps are able to plasticise solid blocks

Today, chocolate pralines take less time to make. Using innovative pump technology delivered by KNOLL, the 12°C chocolate blocks can now be processed directly, thus eliminating the need for preheating in the warming room and all the transportation this involves. This makes the production process more flexible, timesaving and efficient. This gain in productivity partly originates from the KNOLL

double screw pump, which has the ability to process and plasticise solid blocks of chocolate even at very low temperatures. The hard blocks of chocolate are transformed into a viscous mass which can subsequently be conveyed even large distances to the extruder by high-pressure KNOLL MX progressing cavity pumps. The extruder squirts the chocolate filling into the desired shape before the confectionary is finally coated with chocolate and decorated, then cooled and finally packaged.

Continuous flow

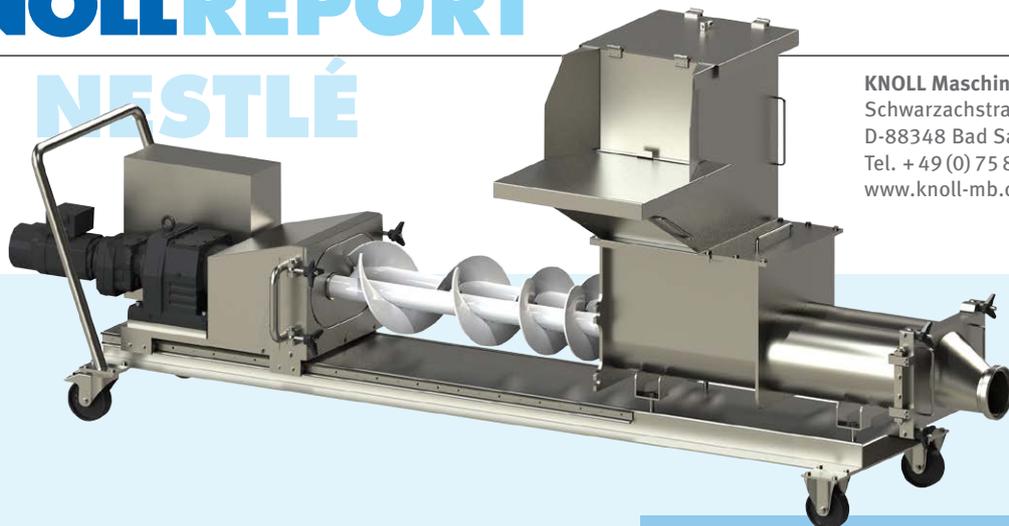
At the heart of a double screw pump such as this is a full screw and an open screw which intermesh. This produces a forced-feed effect, so that everything which enters the pump is reliably pushed out. Formation of rolls is prevented by the interlocking of the screws. Since the air in the screws is able to flow out backwards through a narrow gap, the medium is conveyed continuously and free from air. This is an important factor if the medium is to be cut, processed or dispensed straight after leaving the pressure nozzle.

KNOLL has positioned a gear between the drive and the actual pump for synchronising the screws. That guarantees contact-free intermeshing, minimising wear and contributing to the dry-run safe operation of the pump.

The KNOLL double screw pump is available with plastic or stainless steel screws; the latter are recommended for pro-

Nestlé uses innovative equipment – such as pumps from KNOLL – to produce pralines of such high quality.
Image: Nestlé

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The KNOLL double screw pump is able to process and plasticise solid blocks of product even at very low temperatures.

cessing blocks of chocolate. Plastic screws – made of food-compatible polyamide – are ideal for use at extremely low temperatures, i.e. for processing solid blocks of product at temperatures as low as -18°C. In this case, the pump is preceded by a reducer which breaks the large blocks into pieces 10 x 10 cm in size before they drop into the double screw pump.

Well-thought-out pump design

The delivery capacity of the KNOLL double screw pump, which can be up to 10 t/h, is not the only testament to a well-thought-out development. The ease of cleaning of the pump is also an important criterion in the foodstuffs sector in particular. For example, all separation points feature quick-release catches. The drive unit can be removed from the pump housing on a rail system, complete with the screws. The screws and housing are then exposed and can be manually cleaned with a steam blaster or similar. Very little residue remains in the pump after the conveyance operation. This is because the geometry of the pump housing is so precisely measured that the gap is just a few tenths of a millimetre.

Accident prevention regulations have been strictly observed in the design. For example, a non-contact safety switch provides for reliable stoppage of the drive when the pressure nozzle is opened (this can be done using a hinge).

The KNOLL double-screw pump is designed for the food industry and is therefore fully compliant with FDA requirements. The housing parts and screws are made of high-quality stainless steel or ultra-hard polyamide 6. This plastic is food compatible and resistant to acids, alkalis and oils. Water is also unable to damage it, for the polyamide 6 used does not swell. Compared to stainless steel, the plastic has the advantage of a substantially lower weight.

Characteristics of the double-screw pump

- Reliable plasticising and conveyance of high-viscosity media to block products
- Dry-run safe due to synchronised, contact-free screws
- Straightforward cleaning of screws and housing
- Good removal due to adapted geometry of screws and housing
- Optional funnel with unpacking table
- High conveyance pressure without additional booster pump
- Good safety due to contact-free monitored separation points



In the KNOLL double screw pump (left) the hard blocks of chocolate are transformed into a viscous mass which can subsequently be conveyed even large distances to the extruder by high-pressure KNOLL MX progressing cavity pumps (right). Images: KNOLL Maschinenbau

The number 1 reference

Nestlé is the world's largest food and beverages company and describes itself as the recognised leader in nutrition, health and well-being. In Germany, Nestlé employs over 12,000 people. The headquarters of Nestlé Germany are in Frankfurt am Main.

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