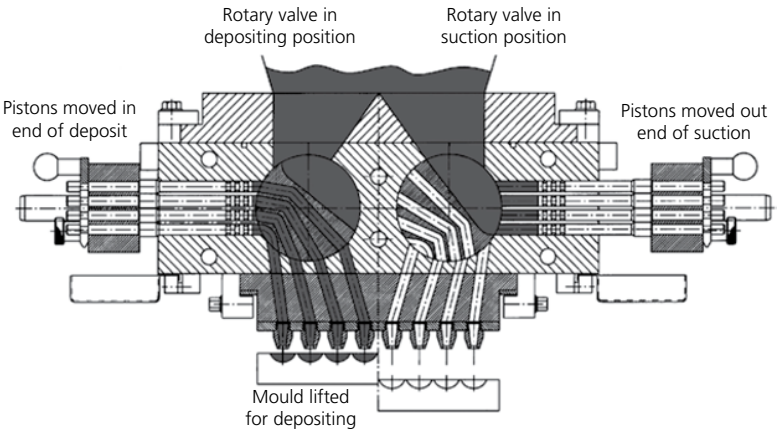

Figure 14.3 Typical piston depositor. Reproduced with permission of Bühler AG, Switzerland.

the moulds – usually an IR thermometer is fitted above the line, but this measures at only one point across the mould. With mould heating being so important it is also recommended to install a sensor before depositing with the function to stop the depositor if the mould temperature is not in the desired range.

14.2.4 Depositors

There are several types of depositor, which will vary depending upon its age, manufacturer and purpose. Piston depositors (Figure 14.3), of which there are many different models, are the most accurate. Their layout can be either linear or rotary. In a modern piston depositor all its motions are accurately controlled by servo drives, which monitor feedback signals from the electric motors and continually adjust any deviation from the expected behaviour of speed, position and torque. The diameter of the pistons and the duration of the stroke determine the volume that can be handled by the depositor. Various different solutions have had to be found to ensure that all the different pistons provide an even distribution of chocolate in every mould cavity all the way across the plant, with the degree of success depending on the manufacturer and on the product. Checking the weight variation across a moulding line should be part of each new product start-up.

Rotary gear depositors (Figure 14.4), which tend to be more compact and somewhat cheaper, are used for tasks requiring less accuracy such as shelling and biscuit applications.

The depositor has three basic components: (i) a jacketed hopper, usually stirred slowly to distribute the mass evenly and minimise variations in temper and temperature, (ii) the piston block, where the mass is metered by being drawn in to the bore and then in the next part of the cycle pushed out into (iii) the depositor plate. It is this complex and heavy device that directs the chocolate into the various cavities in the mould. The depositor plate is interchangeable to

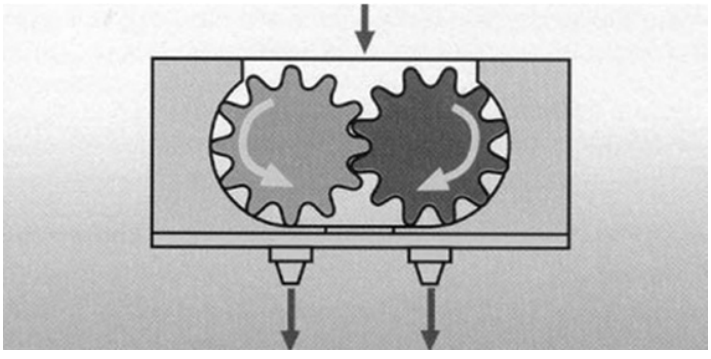

Figure 14.4 Typical gear depositor. Reproduced with permission of Bühler AG, Switzerland.

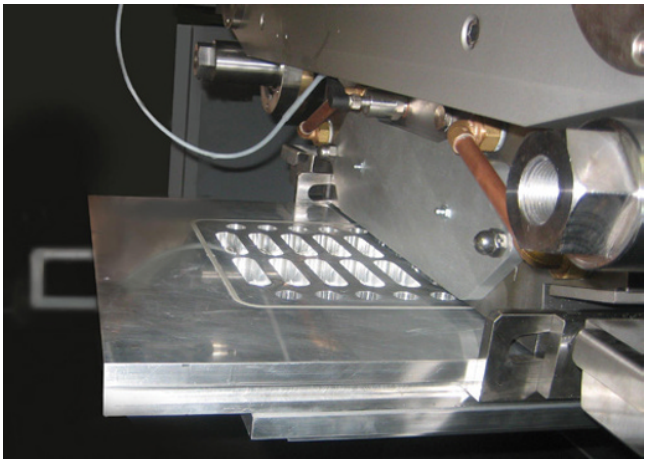

Figure 14.5 Typical depositor plate. Source: Aasted. Reproduced with permission of Aasted Denmark.

adapt the depositor to the layout of the various moulds used on a plant. More than one piston can be used for each cavity, if the product being made is large. The plates on wide plants may have more than 100 nozzles and frequently there are two rows of depositors per plant filling alternate moulds to enable higher operating speeds. The pressure applied to the plate can be as much as 18 bar (260 psi), which is why it has such a massive construction (Figure 14.5).

On some plants, the moulds are lifted up so that they are closer to the depositor and then rapidly dropped back to their normal height: this is done to break any tails that might form when depositing stringy materials such as caramel. There is also the possibility of lifting or lowering the depositor head instead of the moulds, which has basically the same effect. The whole depositor may also move backwards and forward at the same speed as the moulds, or may swing whilst depositing. This is done to allow more accurate positioning of the material being put into the cavities. Other typical parameters that can be adjusted to