



Figure 14.23 Picture of decorating machine. Source: Sollich. Reproduced with permission of Sollich Germany.

Both units require a small local temperer, if the decoration uses a different chocolate masse to the coating.

14.3.13 Cooling

The cooler normally occupies around two thirds of the linear space of the enrober installation. Two types of single level cooler are shown in Figures 14.24 and 14.25. These are the Gainsborough cooler and the Sollich contact radiation cooler seen after most enrobers. Modern Sollich coolers are designed as modular systems of sections, each 3 m in length, which can be individually regulated for air speed and temperature (Sollich, 2014). In a Sollich cooler, cold air enters the product space from the cooling unit via a duct and there is a brief initial cooling by convection. Air flaps in the covers divert cold air to the space above the conveyor where plates above the product are cooled, leading to radiation cooling which is gentler than convection. At the end of the first tunnel air returns to the conditioner via the space below the conveyor so that products in that area are cooled from the bottom (contact cooling). In the second section, cooling is by convection with air flowing with the product and warming up. Again it returns to the cooler below the conveyor (Figure 14.26). High-performance single level coolers operate not only with radiation and convection cooling from above, but can also include cold water contact cooling from below with a water-jacketed slab under the belt.

As with coolers used for moulded products, both latent heat and heat of crystallisation need to be removed. Without the plastic mould to insulate part of the product, cooling times tend to be shorter for enrobers, especially if the cooler belt runs on a cold table.

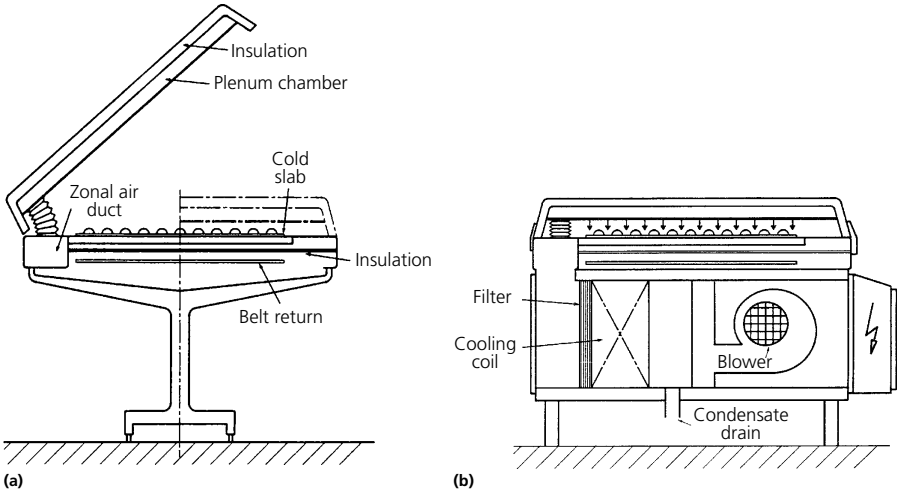


Figure 14.24 Sections through the Gainsborough cooler at (a) the centre and (b) the blower.

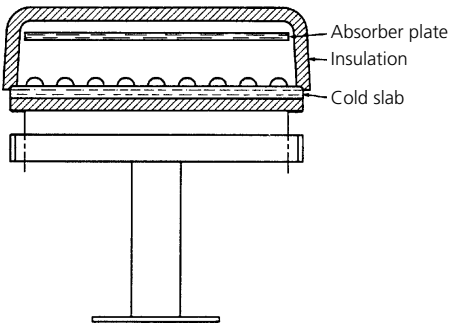


Figure 14.25 Section through a Sollich cooler section. Source: Sollich. Reproduced with permission of Sollich Germany.

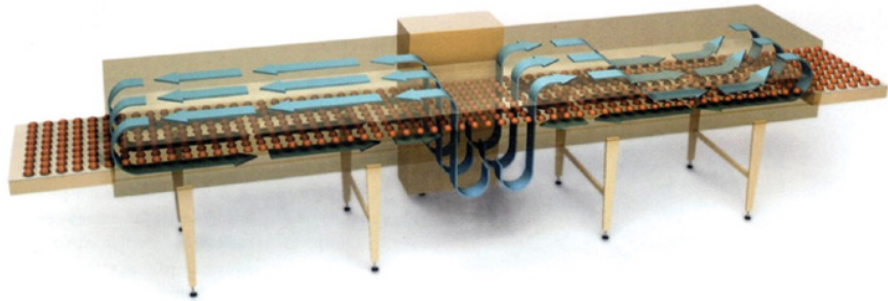


Figure 14.26 Typical airflow in a Sollich cooler (product flows from left to right). Source: Sollich. Reproduced with permission of Sollich Germany.

A higher temperature and longer cooling time are more favourable than a lower temperature and short cooling time. Milk or white chocolate requires a longer cooling time than dark due to higher milk fat contents and consequent lower solidification temperatures.