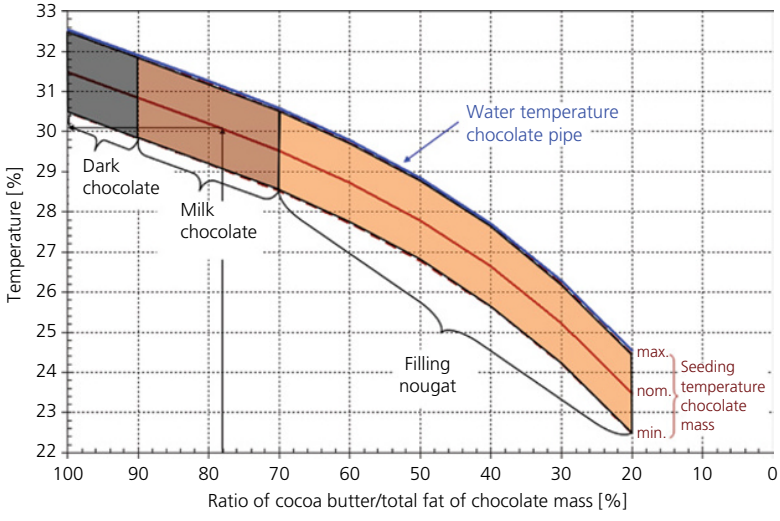

Figure 13.22 Seeding temperature and its dependence on the fat matrix. Reproduced with permission of Bühler AG, Switzerland.

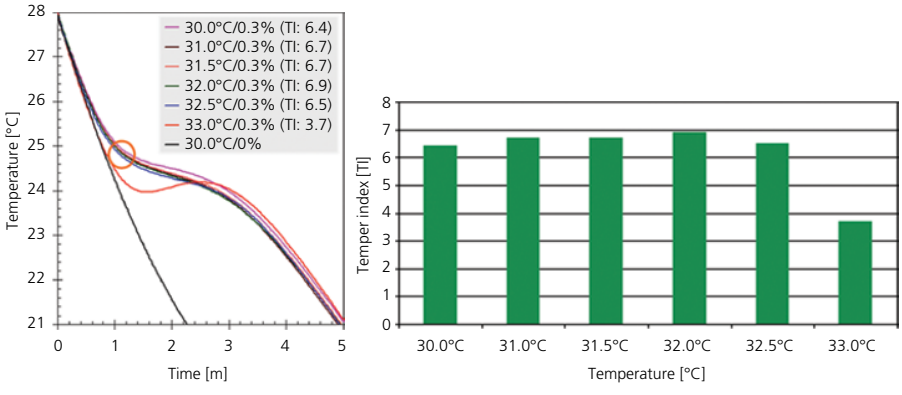

Figure 13.23 Tempering curves for seeded dark chocolate treated at different temperatures. Reproduced with permission of Bühler AG, Switzerland.

In another example, a dark chocolate matrix is seeded with different levels of CBCS (0.2–0.5%), whilst the seeding temperature remains constant at 32 °C (89 °F; Figure 13.24). This time the tempering index changes from a well tempered state (seeding at 0.2%) to an over-tempered one (above 0.3%).

The robustness of the seeding process is demonstrated in Figure 13.25. Here, a dark chocolate of 50% total fat (cocoa content at 65%) was seeded constantly at 0.5% level, with a seeding temperature of 31.5 °C (88 °F).The tempering index remained constant over a 42 h production run.

Milk chocolate behaves the same as all the above dark examples. The seeding process therefore gives the opportunity to deposit and mould or enrobe at

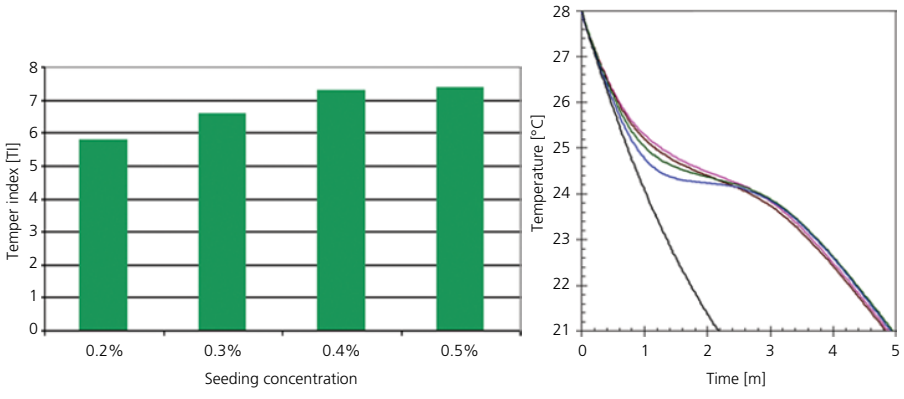

Figure 13.24 Tempering curves of dark chocolate at different levels of CBCS. Reproduced with permission of Bühler AG, Switzerland.

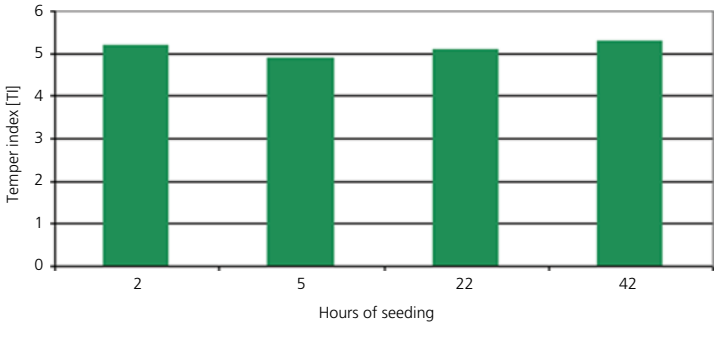

Figure 13.25 Tempering index measurements of seeded dark chocolate over 42 h production. Reproduced with permission of Bühler AG, Switzerland.

significantly higher temperatures than was possible for conventionally tempered chocolates. This greatly affects the flow properties of the chocolate, because chocolate viscosity reduces significantly as the temperature increases. This lower viscosity often produces better coating and weight control, particularly during enrobing. Alternatively lower fat chocolates can be used, yet maintaining the same flow properties.

13.7.2 Semi-solid and solid state

The speed of setting of moulded chocolate during cooling depends on the fraction of seed crystals and their size distribution. Although conventionally tempered chocolates contain more solid fat (0.5–1%, compared to about 0.02–0.3% for seed tempered) and would therefore be expected to set faster, normally the effect of the more finely dispersed seed crystals (seed tempered 3–7 microns, conventionally tempered estimated at >15–20 microns) overcomes this and the seed tempered chocolate sets faster.