Windhab, E. J., Zeng, Y. (2000) Impfkristallisation von Schokoladen mit βVI-Impfkristallen; *International ZDS Symposium Schoko-Technik*..

Windhab, E. J., Zeng, Y. (2002) *Herstellung von Überzügen oder Schalen aus Schokolade oder ähnlichen Fettmassen*, Bühler AG, German Patent DE00A1.

Windhab, E., Rolfes, L., Rohenkohl, H. (1991) Shear-induced effects on crystallization from molten fats. *Chemie Ingenieur Technik*, **63**(4), 385–385.

Windhab, E. J., Niediek, E. A. (1993a) Tieftemperatur-Scherkristallisation. Neue Aspekte der Temperiertechnik, *Süsswaren*, **3**, 32–37.

Windhab, E.J., Rolfes L., Rohenkohl H. (1993b) Method for Continuously Controlling the Texture and Crystallization of Fluid Food Materials. United States Patent **5** 264 234.

Zeng, Y. (2000) *Impf- und Scherkristallisation von Schokoladen*; Dissertation ETH Zürich; Nr.13798

Zeng, Y., Windhab, E. J. (1999) Kontinuierliche Vorkristallisation von Schokoladen durch Animpfen mit hochstabilen β_{VI}-Kakaobutterkristallen, *Chemie Ingenieur Technik*, **71**(9), 1008–1009.

Ziegleder, G. (1985) Verbesserte Kristallisation von Kakaobutter unter dem Einfluss eines Scherge falles. *Internatzional Zeitung Lebensmittel Technische Verfahrenstanden*, **36**, 412–418.

Appendix: Machinery manufacturers

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CHAPTER 14

Moulding, enrobing and cooling chocolate products

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14.1 Introduction

Previous chapters have discussed the manufacture of liquid chocolate, its ingredients and how to handle and temper it. This chapter deals with ways of forming chocolate into a finished product ready for wrapping.

There are two principal ways of doing this. The first is to form the final shape using a mould into which tempered chocolate is poured. This can be a simple dosing operation if making solid tablets, or can include forming a shell of chocolate and adding various fillings to create a more interesting eating experience. Enrobing is the other method and uses a pre-formed centre over which chocolate is poured to produce a coating. The thickness and form of the coat are controlled by using a chocolate masse with the correct viscosity and by blowing off any excess masse using air and then vibration.

Moulding gives a more obvious gloss to the finished product, whilst enrobing can cope with complex shapes and gives a soft and pleasing finish to the article.

In both cases, subsequent cooling is required to prepare the sweets for immediate wrapping. If chocolate is used as the coating, then good temper (see Chapter 13) is a necessary prerequisite, though if a vegetable fat-based compound coating is used, this may not be necessary (see Chapter 19).

14.2 Moulding

14.2.1 Background

Moulding chocolate has been used to make sweets since the nineteenth century. Initially it was carried out entirely by hand but, over the intervening years, automation has gradually taken over. Early moulding lines still required a lot of people to move the moulds from one stage to the next and to carry out operations such as inversion of moulds, topping up depositor hoppers and

Beckett's Industrial Chocolate Manufacture and Use, Fifth Edition. Edited by Stephen T. Beckett, Mark S. Fowler and Gregory R. Ziegler.