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CHAPTER 15

Non-conventional machines and processes

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15.1 Introduction

It is almost impossible to put a clear line between conventional and non-conventional processes. Most companies modify "standard" layouts in some way to give themselves some advantage in their particular circumstances and, no doubt, some manufacturers will be surprised to see some of the processes included in this chapter described as "non-conventional" because they have been using them for many years. However, the vast majority of the world's chocolate is produced on lines using pasters, pre-refiners, refiners and conches, with the chocolate then being mechanically tempered and transformed into chocolate confectionery by moulding, enrobing or panning. I have chosen to regard these as "conventional" processes and, from all the remaining "non-conventional" processes, selected the following for inclusion in this chapter:

- Ultrasonic processes;
- High shear tempering;
- High pressure tempering;
- Extrusion;
- "Single shot" depositing;
- Chocolate aeration;
- Cold forming;
- Paste conching.

15.2 Ultrasound

Nordenskjold and Holmquist (1946) proposed the use of ultrasound to conche chocolate or cocoa mass as early as the 1940s. The high-frequency forces were used to impart energy into the product and this was said to have the following effects:

1 Acceleration of some chemical reactions without changing the form of the reaction, for example the extraction of tannins from cocoa mass;

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