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CHAPTER 12
Bulk chocolate handling

John H. Walker

12.1 Introduction

The output from chocolate manufacturing plants has continued to increase and this, coupled with a demand for higher rates of productivity, has resulted in the transport of ingredients and finished masse becoming more important. Wheeled tanks and the transport of solid blocks of material have often been replaced by the use of pumps and heated pipework. Within large confectionery factories the flow rate of chocolate in the pipelines can be as high as 10 t/h and the distance which it is transported is often 200 m (600 ft) or even more. It is important, therefore, that the pump and pipe system is designed to meet the expected duty. Liquid chocolate is a non-Newtonian fluid and this means that both the yield value and the plastic viscosity and operating temperature (see Chapter 11) must be considered when specifying the chocolate delivery system.

There are many different types of pump that can be used to transport chocolate, each with its own advantages and disadvantages. In addition, there are numerous applications for pumps, ranging from the metering cocoa liquor to pumping tempered chocolate, which means that many different types of pump are employed in a single manufacturing plant. The purchase cost of the pump may also influence the choice, however it should be remembered that the incorrect choice could lead to considerable problems.

12.2 Viscosity and viscometry

12.2.1 What is viscosity?

It is easy to tell the difference between a thin and thick chocolate, but difficult to quantify viscosity in a meaningful way except by using specialised instruments. It is important to understand the influence of the chocolate viscosity since a high viscosity chocolate requires more power to pump than a low viscosity one. Knowing its rheological behaviour therefore, is essential

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