There are various types of equipment and techniques used for tempering chocolate. Advantages and disadvantages of the four major styles of tempering equipment, used for both large-scale and small-scale confectionery applications, are discussed here. Tempering equipment design must take into account three important variables crucial to the tempering process—agitation, temperature and time. In order to choose the appropriate tempering machine, users must have a basic understanding of tempering and how these variables affect the process. Criteria for evaluating tempering equipment include ease of changeover and cleanout, production capacity and operational complexity.

**DEFINITION OF TEMPERING**

Temper can be defined as “the induced partial pre-crystallization of cocoa butter.” However, it is not just any cocoa butter crystal we seek; for optimal final results the stable Form V crystal, also known as β crystal, is the goal. In addition to quality cocoa butter crystals, the correct quantity is also important. We need roughly 2 to 4 percent of the cocoa butter crystallized while the other 96 to 98 percent remains in the liquid phase. These crystals must be well distributed throughout the liquid chocolate.

To produce the right number and size of stable Form V crystals, agitation is one important variable. As a result, some means of mixing or agitation must be part of any tempering machine. We teach budding chocolatiers to temper with a very simple method: stirring chocolate chunks into a bowl of untempered chocolate with a spatula. The best results are achieved by the students who diligently scrape the bowl and keep the chunks moving throughout the liquid chocolate. Another factor related to agitation is shear. In a tempering machine, shear takes place where there is scraping against the cooling surface. More shearing will help create more crystals, while excess shearing creates too many. Mae West said “too much of a good thing can be wonderful,” but in the case of tempering, too many crystals can create problems down the line.

Over time, the small, newly formed cocoa