
Aeration of Boiled Sweets—Vertical Pullers versus Horizontal Pullers

For a long time confectionery manufacturing was more of an art than a science. Technological developments in confectionery manufacturing processes and machinery are changing the industry. Today there is more information available for the confectioner than ever before. In many areas confectionery manufacturing information remains a trade secret. Well-founded manufacturing methods and their resulting good confectionery



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are the last great distinction that remain between manufacturers. In today's competitive environment this distinction can make a winner in the marketplace.

In confection production there is an important process of introducing microscopic air bubbles into the candy known as aeration. Pulling is a method of aerating candy that significantly changes the candy's characteristics. In the last several decades manufacturing has been transformed from manual and labor-intensive methods to less labor-intensive methods using semi-automatic and automatic equipment. Aeration also has changed from hand-pulling to machine-pulling and, in some cases, to continuous aeration. Several different types of pullers have been developed to reduce the effort and manpower needed for the aerating process and also to meet the higher demands of the modern forming lines.

In today's world, assuring safe working conditions is becoming an increasingly important responsibili-

ty of every organization. The nature of vertical pullers requires special attention in safety conscious organizations. Pullers, both vertical and horizontal, are unique in their designs and are used for aeration of boiled sweets.

DEFINITION OF BOILED SWEETS

Boiled sweets are a mixture of liquid sucrose (sugar) and glucose syrup (corn syrup) which is cooked to such a high temperature that the cooked mass is non-crystalline, clear and glassy in appearance. When the boiled sweet is cooled, it becomes hard and retains non-crystalline characteristics. The high-boiled sweet is normally cooked under a vacuum between 135°C–149°C (275°F–300°F), and the moisture content is normally kept between 0.5 percent to 3 percent.

When the high-boiled sweet is cooled, it is in a glassy state or it is a liquid with extremely high viscosity and non-crystalline in nature. The high viscosity of the doctoring agent (corn syrup) slows or stops the migration of sucrose molecules and thus interferes with the process of recrystallization. Although high-boiled sweets appear solid, they are, in fact, supercooled, non-crystalline liquids, which are so far below their softening or melting point that they assume solid properties without crystallizing. The stability of high-boiled sweets is due to the sugars present in the glassy state and this state is metastable. The degree of recrystallization needs to be regulated carefully to prevent crystal formation and to retain a long-lasting glass-like non-crystalline structure.

Some examples of high-boiled sweets are lollipops, fruit discs, starlight mints, peanut brittle, etc.

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