



The Handling And Processing Of Litesse® In The Manufacture Of Chocolate Products

Technical Memo

Introduction

Factors impacting the taste and mouth feel of chocolate include the: sweetness, melting point, heat of solution and solubility of the sugar substitute. Sweetness can easily be manipulated by the appropriate addition of intense sweeteners. Products with low solubility will give rise to a gritty mouth feel, and those with a significant negative heat of solution will give rise to a cooling effect which is not typical in chocolate. Litesse® may be used in combination with polyols to overcome some of these taste considerations by providing a warm, creamy texture in the chocolate matrix without contributing a mouth cooling effect or scratchy aftertaste. Litesse® also helps to balance the flavour profile of sugar free chocolate through the formation of small amounts of caramel during processing. Its low residual acidity ensures that the delicate cocoa and sweet flavours are brought forward and maintained. Conventional conching temperatures are possible with Litesse® so there are no compromises.

Storage

The storage of Litesse® is similar to most food ingredients and should be treated in accordance with good manufacturing practice. With chocolate manufacture particular attention has to be paid to the moisture content of all ingredients and exposure to volatile chemicals that could produce poor flavour of the final product.

Ingredient storage facilities

Litesse® is stable to heat and but it is hygroscopic. When stored in the original packaging, in a dry place below 40 °C (104°F) and at a relative humidity of less than 60% Litesse® can be expected to retain stability for at least two years.

Storage in process environment

Litesse® should be stored in airtight containers in a dry place below 40 °C (104°F). Material stored under these conditions will remain free flowing for several weeks. As with any food manufacturing process the amount of ingredients remaining between production runs should be kept to a minimum. A good way to avoid residual material is to work with batch sizes as multiples of the smallest ingredient package weight.

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Processing

Chocolate manufacture involves the processes of: refining, conching, storage of molten chocolate and tempering.

Refining

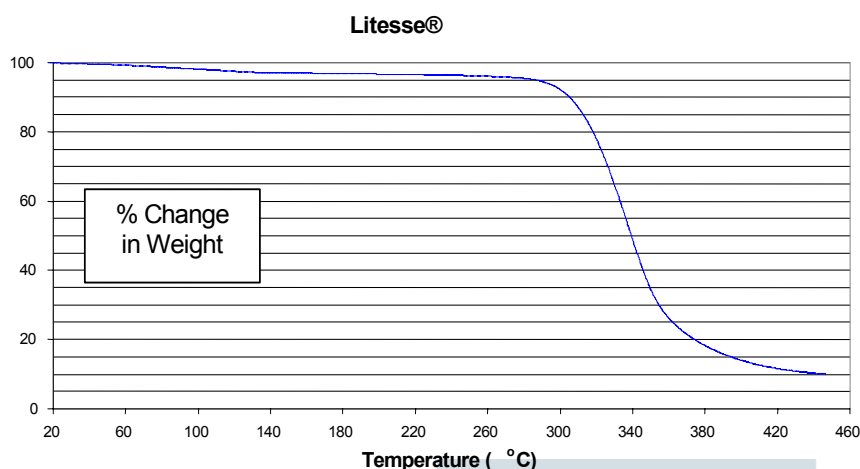
Litesse® is mixed with the other chocolate ingredients such as cocoa mass and milk ingredients to make the refiner paste as with traditional chocolate manufacture. Litesse® requires no special pre treatment or refining conditions.

Conching

One of the most important process parameters is the conching temperature. For milk chocolate this is typically a maximum of 60 °C (140 °F) above this temperature the milk protein denatures causing a dramatic and irreversible increase in chocolate viscosity. For plain chocolate higher temperatures are used up to 105 °C (221 °F). Litesse® is stable at these processing temperatures with a glass transition temperature of 109 °C (228 °F).

The following diagram shows the temperature stability of Litesse® over a range of temperatures. It can be seen that Litesse® is extremely stable to temperatures far higher than those encountered in chocolate processing.

Thermal Gravimetric Analysis



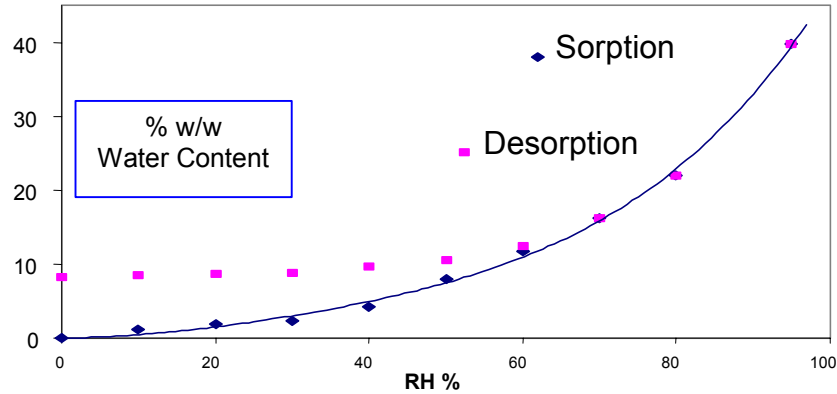
Molten chocolate storage

Litesse® does not cause the chocolate mass to thicken on storage. The most common cause of this effect is the release of moisture from the ingredients into the chocolate matrix. Litesse® retains moisture in a very stable glassy matrix as shown in the sorption - desorption isotherm below.

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Sorption - Desorption Isotherm



Chocolate tempering

The presence of Litesse® in the chocolate matrix has no measurable effect on tempering compared to a similar recipe chocolate made with sugar. The types of fats in the recipe, such as butter fat from the milk ingredients and vegetable fats have the greatest influence on the tempering conditions required.

Commercial products

Litesse® is used in many chocolate products around the world. These are products made using traditional manufacturing equipment and processing conditions.