

SUCROSE ESTERS IN STICKY CONFECTIONERY





INTRODUCTION

Confectionery products (chewies, caramels and cereal bars) often stick to teeth, fingers, wrappers or process equipment. This stickiness is related to the adhesion of a product to surfaces for example, candy which is sticking to fingers shows a great adhesion to fingers. Adhesion itself is related to factors such as; sugar-type, water and fat content, viscosity, temperature and acidity. Sisterna sucrose esters are added to confectionery products to emulsify fat, by doing this at the same time they significantly reduce the stickiness of confectionery products.

SISTERNA SUCROSE ESTERS IN BINDER SYRUPS FOR CEREAL BARS

Sucrose esters have been used in cereal bar manufacturing for many years. Primarily they were used as emulsifiers to ensure that the fat was properly mixed and stabilised into the syrup in the tanks. Soon it was noted that slab formation and slitting and cutting ran more smoothly, there was less staining of equipment and product loss was reduced. By closer observation it was revealed that the binder syrup was sticking less to the production equipment. The addition of sucrose esters did not seem to change the appearance or firmness of the bar.

Today manufacturers use sucrose esters as a processing aide in cereal bar processing.

A new development is the replacement of lecithin with a GMO-free alternative; sucrose esters can easily fill in this gap.

THE METHOD FOR MEASURING STICKINESS*

Sisterna has now proven that binding syrups with sucrose esters effectively reduce adherence thus stick less to stainless steel in comparison to reference recipes. The below described test has proven the anti-stickiness effect sucrose esters have in confectionery.

To study the adherence, 150 g of the syrup (T = 35°C) was added to a stainless steel wall at an angle of 80° at room temperature. The time in which the syrup flowed was measured and the percentage adhesiveness of the binding syrup was calculated based on the weight of the binder syrup that remained on the wall. This is a measurement for adhesion or stickiness.



Picture 1: Arrangement of the stainless steel wall in the laboratory.

THE RESULTS OF SISTERNA SUCROSE ESTERS ON STICKINESS IN BINDER SYRUPS FOR CEREAL BARS

In the study, glucose syrup (48%), sugar (35%) and water were boiled and melted fat (5%) was added until the dry matter measured 85%. For the recipes with sucrose esters, Sisterna SP70 in different dosages (0.02%, 0.05%, 0.1%), Sisterna SP50 and Sisterna SP30 (0.05%) were mixed into the sugar and cooked in the syrup. When using lecithin, the lecithin was dissolved in the fat.

STICKY CONFECTIONERY



Average adhesion % (n2)



Amount of binder syrup on the stainless steel wall in % of the total applied binder syrup. A high amount on the wall converts to high stickiness to stainless steel.

LOWER ADHESION WITH SUCROSE ESTERS

Sisterna SP70 (0.02%-0.1%) proved to reduce the stickiness of binding syrups to stainless steel. In comparison with the syrup without emulsifier, the syrup with 0.5% of Sisterna SP70 showed significantly reduced adhesion (17%), as shown in Figure 2. A higher dosage of Sisterna SP70 further reduced the adhesion amount (28-33%). Lecithin (LC= 0.2%) or Sisterna SP30 (0.05%) did not effectively reduce adhesion.

The flow rate (0.06-0.07 g/s) and viscosity (38,000-42,000 mPas, $T = 30^{\circ}$ C) of all samples were similar and therefore could not affect the adhesion amount.

CONCLUSION

The anti-stickiness effect of Sisterna[®] sucrose esters in confectionery is already noticed by consumers and manufacturers. With this test tool we have proved the anti-sticking effect in standardised environment. This tool is available for our customers who also wish to reduce the stickiness of their confectionery products.

Sisterna L70-C 0.12%, a liquid solution of sucrose esters, could be used to replace the powdered Sisterna SP70 0.05% in cereal bars.

* Developed by Michalski, M.C. et all, Adhesion of food emulsions to packaging and equipment surfaces, Colloids and surfaces, 1999.

Warranty

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