

experts in emulsifiers and stabilizers for bakery, confectionery, dairy, ice cream, margarine and fine foods - and we are happy to share our expertise. our company values can be defined in just three words: **loyalty, responsibility** and **commitment**. and we aim to be the preferred partner for our customers. we treat information confidentially and know how to keep a business secret. to Palsgaard **responsibility** means caring about the environment and being aware of our corporate social responsibility; we have a goal to be CO<sub>2</sub> neutral by 2020 and are members of SEDEX and RSPO. to Palsgaard **commitment** means we are dedicated to getting the best results for our customers' products - to the benefit of their customers. we care about our employees and have a declared aim that Palsgaard must be a pleasant place to work. Palsgaard we know that our most important resource is the know-how and dedication found in our employees. **Heart** we are committed to getting the best results with our products in our pilot plants and in your facilities. **Working** at Palsgaard we don't sell standard solutions - we start with YOUR needs. Palsgaard - Heart Working **People** heart work is the best way to achieve success - let us help YOU get it. our products are produced according to the strictest quality criteria. we are experts in emulsifiers and stabilizers and we are happy to share our expertise with you. let our pilot plants help you shorten the step between idea and your new product. heart work is the best way to succeed - let us help YOU do so.

## The ideal cake emulsifier – one product does it all



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Cake emulsifiers are vital ingredients in cakes due to the complicated interaction with the other ingredients such as eggs, flour, sugar, milk powder, oil, cocoa etc. Often several cake emulsifiers are used to create the desired variety of cakes and this makes the production more complicated due to the handling of several ingredients, and result in a very long list of ingredients on the label. Palsgaard decided to see if it were possible to create a single cake emulsifier, able to meet these challenges. The result: Emulpals® 110.

### CAN ONE EMULSIFIER DO IT ALL?

Imagine the requirements of the unique cake emulsifier possessing all the desired properties highly valued by the cake mix producers, the cake industry and the end users:

- A product with a unique uniform performance in all types of cake mixes and a minimum of 2 years optimal functional shelf life which would secure a uniform and long functionality in the cake mixes leading to satisfied end-users
- A fast and efficient product with a very good tolerance to difficult ingredients such as egg powder, cocoa and oil - in other words a very versatile and robust cake emulsifier
- A smart emulsifier composition which would open up the possibility to create cakes with lower amounts of saturated fats and at the same time result in a shorter list of ingredients
- A cake emulsifier which could facilitate the production of almost all types of cakes by recipe engineering and result in high quality cakes even with an improved cost in use calculations

Palsgaard A/S has matched these requirements by developing and fine-tuning a cake emulsifier which more than meets these demands

The product is named Emulpals® 110 – also known as “The safe choice”.

It possesses 3 major and very important benefits:

- Superior stability over minimum 24 months
- Stable batch-to-batch performance
- Superior tolerance

The development of Emulpals® 110 has been followed by intensive performance- and shelf-life tests which have been carried out

in both in-house application labs at Palsgaard as well as at several production sites. The results of the various testings resulted in a number of performance benefits which, when put together paint a perfect picture of a unique and special product - a product that does it all.

Apart from the three major benefits several others should be mentioned in order to paint the full picture of a unique product:

### STABILITY & PERFORMANCE

Emulpals® 110 is based on specially selected polyglycerol esters and mono- and diglycerides which

### WHAT IS SPECIAL ABOUT ACTIVATED CAKE EMULSIFIERS?

*Activated cake emulsifiers such as Emulpals® 110 are extruded emulsifier systems distributed on a food carrier. This innovative process creates a very large surface area - several m<sup>2</sup> in one single gramme. The effect is instant functionality, fast uptake and incorporation of air into a cake batter leading to improved stability and a superior cake quality.*



have been optimized to perfect performance in cake systems. The emulsifiers are finally activated on rice starch in a highly sophisticated extrusion process resulting in a convenient free flowing off-white powder. The whipping active emulsifier is fixed to the outer surface of the starch particles during the extrusion process and has proven to be extremely stable in functionality during storage. The activation process provides an instant functionality of Emulpals® 110 once in contact with water and energy, in other words when the whipping starts. The continuous production process enables a functional uniformity second to none, which is documented in the specially developed aeration and baking control (ABC test) carried out on samples drawn with intervals over every production run. Figure 1 shows the batch-to-batch stability of Emulpals® 110 over a period of 2 years.

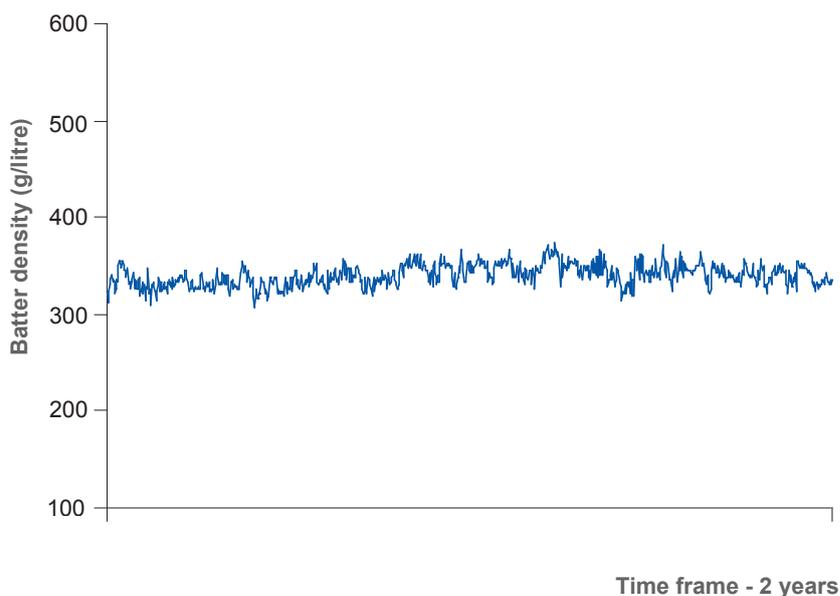
**SUPERIOR STABILITY  
OVER MINIMUM 24 MONTHS**

As a standard, a random number of samples are drawn from the production runs and kept under normal fluctuating temperatures for at least the shelf-life period, which in the case of Emulpals® 110 is minimum 24 months. In the shelf life period – and actually much longer - the functionality of Emulpals® 110 is not significantly changed and will therefore be fully functional in cake mixes during the entire shelf life period. Figure 2 shows the storage stability of Emulpals® 110 over a 2 year period.

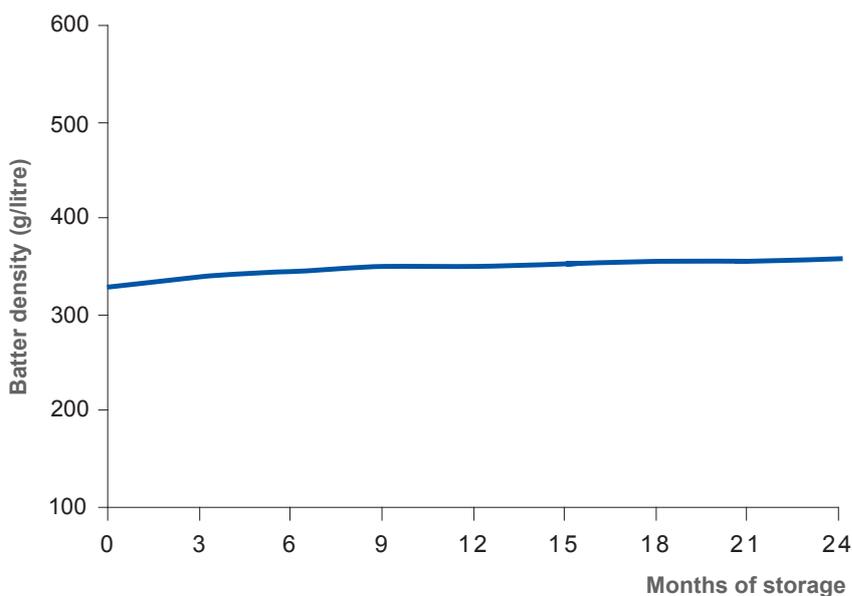
**TOLERANT  
AERATION PERFORMANCE**

Emulpals® 110 can be characterized as an all-in medium fast cake emulsifier which means no need for adding the ingredients in steps. The aeration develops already after a minute and reaches its optimum after 5 – 8 minutes which is perfectly in balance with the other ingredients in the cakes. The risk of over-whipping is not an issue

**Figure 1: Batch-to-batch stability of Emulpals® 110**



**Figure 2: Storage stability of Emulpals® 110 over a 2 year period**

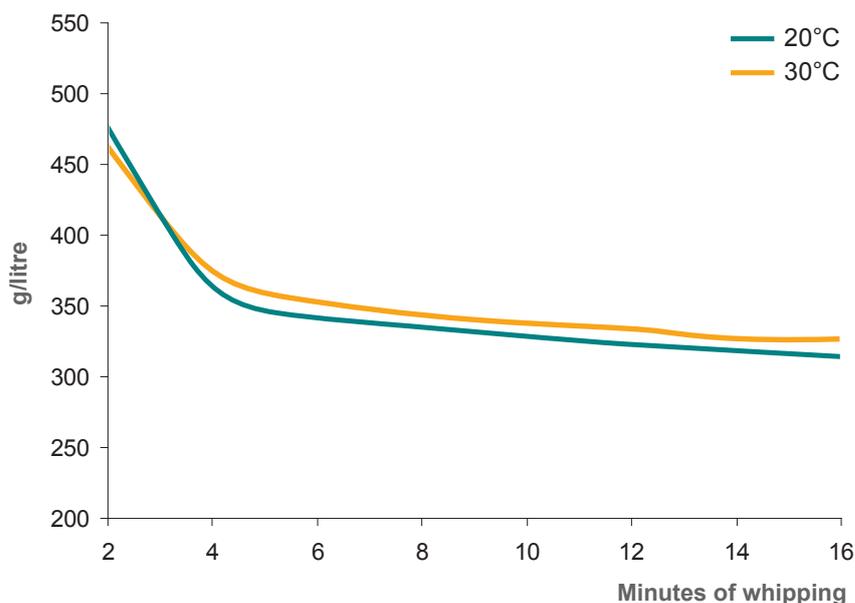


due to the very stable batter created by the interaction between the emulsifiers and the protein in the cake batter.

A potential problem when making cakes is the seasonal temperature fluctuations of the ingredients and the production room which often leads to variation in the cakes. This is not the case when using Emulpals® 110 due to the tolerance to temperatures in the batter.

In Figure 3 the whipping performance of a batter based on Emulpals® 110 is tested with batter temperatures of 20°C and 30°C and as shown the performance is very similar at both temperatures. In addition to this the graph shows the stability against over-whipping as basically no change is seen from 6 to 16 min. of whipping.

**Figure 3:** Whipping profile of Emulpals® 110 at different temperatures



### RECIPE ENGINEERING & PRODUCT DEVELOPMENT

Using only one cake emulsifier in various mixes makes the declaration easy and simple – and when the components in the emulsifier is limited to 2 emulsifiers and one activating medium (rice starch) it can hardly be more simple. Contrary to protein and sugars which are components in other powdered cake emulsifiers, rice starch will not add any colour to the finished cake.

This benefit opens up for convenient and easy dosage changes in recipes without having to worry about a potential colour change and therefore this contributes to making Emulpals® 110 a very versatile product. This and the stable performance of Emulpals® 110 over a big dosage range makes it possible to make fluffy and light cakes, more dense and juicy cakes, various crumb structures and cakes with cocoa, high amounts of eggs and oil – all with one cake emulsifier and only by adjusting the dosage and the components in the recipes.

Being free of allergens, completely vegetable and free of trans fats, Emulpals® 110 fits in all types of recipes from vegan to gluten free which makes product development so much easier.

As part of Emulpals® 110 is starch this part can be taken out of the recipe and replaced with e.g. flour and this way balance the recipe and at the same time achieve cost savings on the total recipe without changing the nature of the cakes.

### REDUCING SATURATED FATS IN CAKES

The emulsifier tolerates high amounts of oil in both aerated and non-aerated cake systems. In aerated systems such as the typical Asian sponge cake which is a highly aerated sponge cake with an addition of 10% of liquid oil, Emulpals® 110 has proven to be a highly valued ingredient as it creates a very stable aerated cake batter able to absorb and stabilize high amounts of liquid oil, resulting in a very soft and delicious cake.

Non aerated cakes such as pound cakes are often based on margarine or shortening which contain high amounts of saturated



fats. With Emulpals® 110 as cake emulsifier all the solid fat can be replaced by liquid oil without changing the nature of the pound cake – apart from the possibility of achieving a softer and juicier cake and an easier production process.

In general this opens the possibility of reducing the overall fat content, and just as important changing the composition of the fat in a more healthy direction. Utilizing the properties of Emulpals® 110 it is possible to replace 90% of the saturated fat in a traditional pound cake with the healthier unsaturated fats and in addition to this an overall fat reduction is possible.

### THE IMPORTANCE OF UNIFORMITY, ROBUSTNESS AND VERSATILITY

The uniformity is important for bakers and food services worldwide as it enables them to easily make the same delicious cakes every day in all climates and this way increase customer satisfaction.

The uniformity and the batter stability is crucial for industrial bakeries securing a completely uniform cake production, no loss of batter stability during pumping or storage of the batter, and a resulting stable cake which can be handled and packed on highly automated lines without time consuming adjustments.

The robustness and versatility of Emulpals® 110 are highly valued properties in retail mixes where cake making is different from house to house. There will be variations in the scaling and egg size, added milk or water, oil or margarine, special homemade innovations and last but not least the whipping or mixing and the baking. These are all important variables which call for the unique stability and robustness possessed by Emulpals® 110.

### PRACTICAL APPLICATIONS

The above performance characteristics makes Emulpals® 110 the ideal choice for the cake mixes used by bakers and food services, the industrial mixes used by cake factories as well as for the retail mixes used by household consumers worldwide.

In general the composition of Emulpals® 110 provides the benefit of leaner labelling, easier product development, possibility of reducing saturated fats and an overall use in various special products with claims such as ad vegetable, free of allergens etc.

This and all the special properties of Emulpals® 110 makes it a highly valued product development tool.

**All these benefits and advantages means that using Emulpals® 110 will be a safe choice.**

For more information on Emulpals® 110, please contact Product and Application Manager Arne Pedersen at [ap@palsgaard.dk](mailto:ap@palsgaard.dk) or tel 45 7682 7682.

Emulpals® 110 is highly versatile and can be used for both bakers mixes, industrial cakes and retail mixes

