For flow property
and crystallisation control

Palsgaard®
World no. 1 in non-GMO chocolate and confectionery emulsifiers
The go-to place in chocolate-making

Palsgaard is known throughout the world as the global market leader in non-GMO chocolate emulsifiers such as PGPR, and AMP, which can supplement or outperform lecithin. These ingredients help to achieve specific flow properties, avoid thickening of the chocolate mass when developing low-fat chocolate and even cut costs.

Alongside these emulsifiers, we also offer a wide range of vegetable fat-based oil binders and crystal promoters to prevent separation and accelerate crystallisation in confectionery products. With many years of experience in the manufacture of baked goods, ice cream and fat-based fillings, Palsgaard is the ideal partner for developing a complete range of complex confections from chocolate-coated Swiss rolls to ice cream.

Optimise your recipes

Extensive expertise in rheology and chocolate flow properties, combined with state-of-the-art equipment, makes us the front runners in chocolate and confectionery emulsifiers, and we are keen to share our knowledge for the benefit of our customers. You’ll find that a small amount of our emulsifiers will go a very long way. And by letting you take control of each step of the production process, from blending or conching to cooling, our top-of-the-range application centres located in Mexico and Denmark allow you to fine-tune and prepare your exact chocolate recipes under controlled manufacturing conditions.

Emulsifiers made with a clear conscience

At Palsgaard, we take corporate social responsibility seriously and have done so for more than a century. Our most recent efforts include achieving our goal of carbon neutral production across all our production sites two years ahead of our 2020 target. Equally, all of our palm-based emulsifiers are made from RSPO SG-certified palm oil.
The chocolate maker’s best emulsifier alternative to lecithin

Your new emulsifier champion
Sunflower-oil-based Palsgaard® AMP 4455 is the latest development in ammonium phosphatide chocolate emulsifiers which have been used by the confectionery industry as an efficient alternative to lecithin since the 1960’s. Palsgaard® AMP 4455 is a unique and flexible non-palm production tool that delivers cocoa butter savings as well as a range of other benefits at any level of dosage. It’s easier to use than lecithin, and outperforms it in reducing the chocolate’s plastic viscosity and yield value – using as little as 40% of the normally applied dosage.

Incomparable viscosity control
Nothing gives you as much control over viscosity as Palsgaard® AMP 4455. Whether you’re working with regular or low-fat recipes, you can get all the control you need – without the taste or odour downsides of lecithin.

Key to this emulsifier’s outstanding performance is that increasing the dosage of Palsgaard® AMP 4455 doesn’t increase yield value. Instead, you can dose up to 1% Palsgaard® AMP 4455 to achieve the desired viscosity reduction. And it’s this unique ability that opens the door to new, low-fat, low-calorie and low-cost recipes.

Unique cost-saver
Palsgaard® AMP 4455 can be used as a new and highly effective avenue to explore potential savings and expand profit margins. For example, using lecithin in chocolate at a dosage of around 0.4% normally provides cocoa butter or vegetable fat savings of around 4%. At the same dosage level, however, Palsgaard® AMP 4455 can extend these savings by an additional 2 to 3% to create a total potential saving of 6 to 7%.

Microbiologically safe
All batches of Palsgaard® AMP 4455 are produced in hygienic, sealed machinery at temperatures where microorganisms cannot survive. And in the event of contamination further along the supply chain, all microorganism activity would cease in less than a week.

Neutral taste and odour
The taste and odour neutrality of Palsgaard® AMP 4455 lets you use it, unlike lecithin, at high dosages in applications sensitive to off-flavours, such as crumb chocolate with its low content of cocoa solids, white chocolate, or white confectionery spreads.

Palsgaard® AMP 4455 is a showcase of compliance with widely demanded manufacturer and consumer preferences, offering the following:

- 100% vegetable-based
- Non-palm ingredients origin
- Non-GMO status
- Contains no allergens
- Non-soya
- Kosher & Halal certifications available
- Pumpable at room temperature for easy handling
Avoid moisture problems in ice cream coatings

A typical production challenge in ice cream production is increased viscosity of the ice cream coating which is due to ice cream leaking into the coating during the dipping process. This will lead to a number of negative consequences – e.g., thicker coating layers leading to increased costs, irregular product quality, pin holes, final product waste, etc. You can avoid this by using a combination of Palsgaard® PGPR 4150 and Palsgaard® AMP 4455.

Easy flow at ambient temperatures

Contrary to lecithin, Palsgaard® AMP 4455 is in liquid and easy flowing form, making it easy to dose at any temperature and add directly to your production. This advantage will also minimize possible off-flavours from burnt lecithin due to excessive heating over longer periods.

Comparison of viscosity of Palsgaard® AMP 4455 and a typical lecithin at different temperatures.

Viscosity (Pa.s)

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Palsgaard® AMP 4455</th>
<th>Soya lecithin</th>
</tr>
</thead>
<tbody>
<tr>
<td>15°C</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>25°C</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>35°C</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>45°C</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>55°C</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

17 15 12 9 6 3
Always achieve perfect consistency

Simplify chocolate production with unique, flavour-neutral PGPR products that you can rely on to control flow properties every single time. Years of research and testing using real chocolate have gone into the creation of Palsgaard’s series of PGPR products making us the clear leaders in this field.

As a result, all Palsgaard PGPR products are completely free from off-flavour and bad castor oil odour, securing the chocolate manufacturer a better chocolate product. Contrary to most PGPRs on the market, Palsgaard’s product range is based on non-palm ingredients.

Results that speak for themselves

Palsgaard® PGPR 4150 is unique for demanding applications such as enrobing, very low fat formulations and in general where you need precise control over flow properties. With a yield value reduction of app. 80%, and a remarkable batch-to-batch stability (measured over a 24-month period), Palsgaard® PGPR 4150 easily outperforms standard PGPR products on the market. The result is minimal variation under real life conditions guaranteeing you significant and stable viscosity reduction.

Viscosity Reducing Power (VRP) of Palsgaard® PGPR 4150
Easy flowing chocolate

Smoothing out problems
Uniformity is the key word attached to Palsgaard® PGPR 4125. Each individual batch of any PGPR at Palsgaard is performance tested for its viscosity-reducing power (VRP) in real chocolate – and the very stable measurements of VRP for Palsgaard® PGPR 4125 has made it famous for a uniformity that allows it to contribute significantly to your smooth and problem free chocolate production.

Guaranteed performance
At Palsgaard we’ve spent many years developing and refining our VRP method. Our first-rate instrumentation, experienced personnel and standardised processes ensure trustworthy and reliable measurements. Palsgaard is the only company in the world to carry out this level of critical testing with real chocolate – one of the reasons for our market-leading position in chocolate emulsifiers. You can therefore have confidence in a stable and secure performance of each batch of Palsgaard PGPR.

Cost optimised and high-performing
For applications focused on finding the best possible match between cost and performance, Palsgaard® PGPR 4120 is a strong contender. As with all Palsgaard PGPRs it offers:

- Neutral flavour and odour
- Transparency
- Min. 2 years shelf-life
- Cost reduction benefits
- Non-GMO compliance
- Based on non-palm ingredients
Increased stability
A common problem faced when producing confectionery products with a high amount of liquid oil is oil separation. Products facing this problem could be chocolate/hazelnut spreads, peanut butter, tahina and halwa. We offer the perfect solution for this with a range of powdered fats that ensures excellent stability.

Smooth & creamy products
Palsgaard® OilBinder 01 is manufactured from an optimised blend of vegetable oils, and contains no trans fatty acids. It can be supplied with RSPO Segregated certification. This special tri-glyceride mix has been developed to have excellent oil absorbing properties, and is particularly good in semi-liquid products with 30-60% liquid oil content. Palsgaard® OilBinder 01 works by creating a fine net of crystals during cooling of the confectionery product. During cooling the crystals entrap/stabilize the liquid oil to create more stability and longer shelf-life. The product is available in both pellet and powder form.

The non-hydrogenated solution
Palsgaard® OilBinder 02 is the ideal choice when only solutions without hydrogenation are accepted. Palsgaard® OilBinder 02 is manufactured from an optimised blend of palm oil, and has no trans fatty acids. The product is easy to handle and dose as the product comes in pellet form.

Application areas
With Palsgaard® OilBinders it is possible to get a flexible product that allows for easy product development for both hot and cold climates. It is possible to play with the texture of the product to achieve a smooth or harder product depending on demand.

<table>
<thead>
<tr>
<th>Product</th>
<th>Liquid Oil Content</th>
<th>Palsgaard® OilBinder 01</th>
<th>Storage Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chocolate spread</td>
<td>32%</td>
<td>0.5% 1.0% 1.5% 2.0%</td>
<td>20-25°C 30-35°C</td>
</tr>
<tr>
<td>Peanut butter</td>
<td>42%</td>
<td></td>
<td>Storage temperature</td>
</tr>
<tr>
<td>Tahina</td>
<td>62%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Addition of Palsgaard® Oilbinder 01 to achieve stability at different liquid oil fat levels
PALSGAARD® CRYSTAL PROMOTOR

An excellent crystallisation starter

Product improvements

*Palsgaard® CrystalPromoter 41* optimises the crystallisation speed in applications like unhardened CBS-, CBR-, low trans CBR compounds, low saturated fat fillings or confectionery fat systems where cooling takes too long in the cooling tunnel. *Palsgaard® CrystalPromoter 41* is non-GMO, trans-free and 100% vegetable fat based. *Palsgaard® CrystalPromoter 41* consists of rape seed oil, and is therefore palm-free.

High speed crystallisation

Going from highly saturated fat solutions to low saturated fat solutions often means stability and crystallisation problems in confectionery products just as changing from hard, fast crystallising fats to more liquid, slow crystallising fats is a well-known challenge. *Palsgaard® CrystalPromoter 41* is an excellent crystallisation starter and can play an important role in these cases. Instead of losing 30-50% speed during cooling, only 10-15% will be lost when using *Palsgaard® CrystalPromoter 41*.

Small dosage – big effect

*Palsgaard® CrystalPromoter 41* comes in powder form. This makes it easy to melt and distribute in confectionery productions. With *Palsgaard® CrystalPromoter 41* a big effect is achieved with a small dosage.
Key elements for market success with AMP, PGPR, oilbinders & crystal promotor

**BRINGING GOOD THINGS TOGETHER**

**PALSGAARD PRODUCTS MEAN**
- High performance
- Outstanding functional stability
- Specially developed for functionality in chocolate and compounds
- Neutral taste and odour
- Extended analytical control
- Viscosity reducing power (VRP) tested in chocolate

**PALSGAARD PRODUCTION OFFERS**
- One line – one product type philosophy
- Modern and optimised production equipment
- ISO/FSSC 22000 certified
- Non-GMO, Kosher and Halal certified
- RSPO (Roundtable on Sustainable Palm oil) SCCS certification – Segregated status
- Produced in CO₂-neutral factories

**PALSGAARD CUSTOMERS GET**
- Application expertise
- Deep insights in rheology
- Unique and dedicated products
- Documented functionality
- Consistent production
- No off-taste in chocolate
- Broadest range of chocolate emulsifiers
- Barrier breaking innovations
- Wide range of packaging and palletizing options
- Vegetable-based products
Let’s help you innovate

As a global emulsifier producer, Palsgaard has unique insights into local requirements and new trends. Adjusting recipes, optimising flow properties, reducing costs, increasing stability, or achieving faster crystallisation – along with making the impossible possible, are only some of the services we can offer you.

Our fully equipped application centres in Denmark and Mexico provide the best basis of understanding the complex nature of chocolate and confectionery manufacturing – and application specialists gladly share their know-how.