

Chocolate and confectionery emulsifiers

For flow property
and crystallisation control



Palsgaard®



World no.1 in non-GMO chocolate and confectionery emulsifiers

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 significantly reduce costs.

Your ideal partner

Alongside our chocolate and confectionery 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.

The best emulsifier alternatives to lecithin

Your new emulsifier champions

Sunflower-based **Palsgaard® AMP 4455** and its rapeseed-based twin **Palsgaard® AMP 4458** are the latest developments in ammonium phosphatide chocolate emulsifiers which have been used by the confectionery industry as an efficient alternative to lecithin since the 1960s. Both **Palsgaard® AMPs** are unique and flexible non-palm production tools that deliver cocoa butter savings as well as a range of other benefits at any level of dosage. Either product is 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** and **Palsgaard® AMP 4458**. 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 their outstanding performance is that increasing the dosage of either **Palsgaard® AMP 4455** or **Palsgaard® AMP 4458** doesn't increase yield value. Instead, you can dose up to 1% **Palsgaard® AMPs** 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.

Palsgaard® AMPs are a showcase of compliance

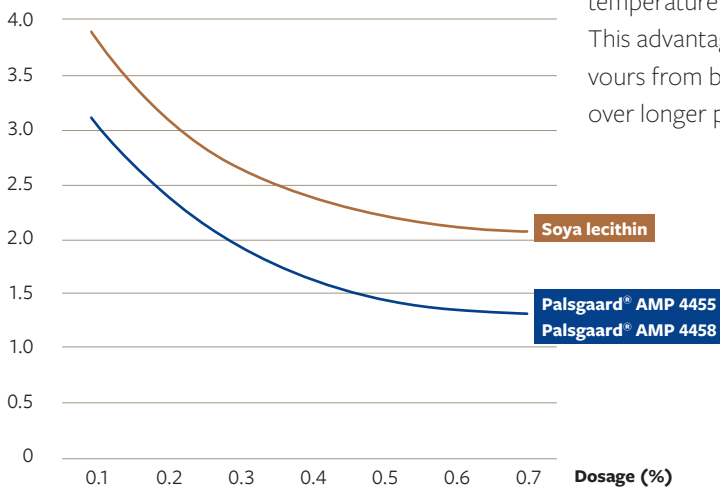
- 100% vegetable-based
- Neutral taste and odour
- Based on either sunflower oil or rapeseed oil, ensuring a safe and stable supply
- Non-palm ingredients origin
- Non-GMO status
- Contains no allergens
- Non-soya
- Kosher & Halal certifications available
- Pumpable at room temperature for easy handling



Unique cost-savers

Palsgaard® AMP 4455 and **Palsgaard® AMP 4458** 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, both **Palsgaard® AMPs** can extend these savings by an additional 2 to 3% to create a total potential saving of 6 to 7%.

Plastic viscosity (Pa.s) / Milk chocolate 31%



Palsgaard® AMP 4458 is just as easy to use as lecithin, but outperforms it in reducing the chocolate's plastic viscosity – using as little as 40 percent of the normally applied dosage.

Micro-biologically safe

All batches of **Palsgaard® AMPs** are produced in hygienic, sealed machinery at temperatures where micro-organisms cannot survive. And in the event of contamination further along the supply chain, all micro-organism activity would cease in less than a week.

Easy flow at ambient temperatures

Contrary to lecithin, **Palsgaard® AMPs** are 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.



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® AMP 4458** or **Palsgaard® AMP 4458** and **Palsgaard® PGPR 4190**.



Crystal clear PGPR leadership

Always achieve perfect consistency

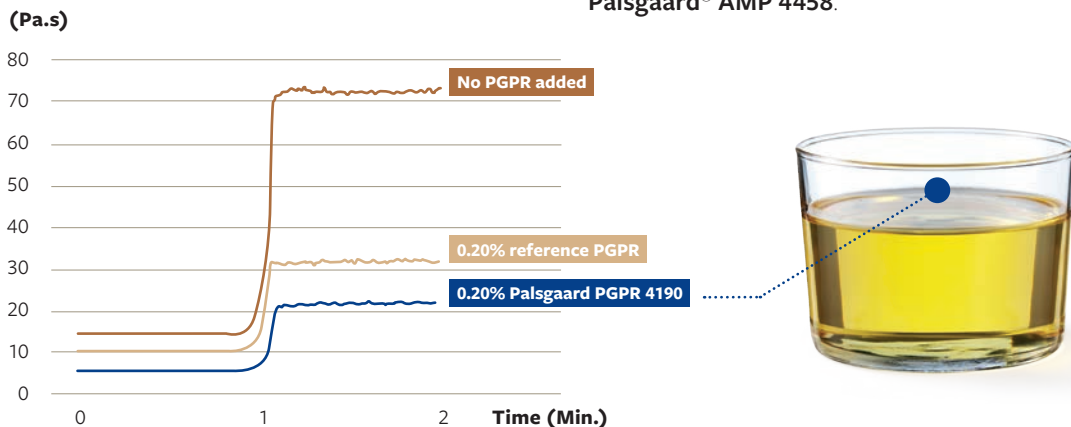
Simplify chocolate production with unique, flavour-neutral PGPR products that you can rely on to control flow properties every single time. Years of research and testing using real chocolate have gone into the creation of Palsgaard's series of PGPR products, making us the clear leaders in this field.

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.

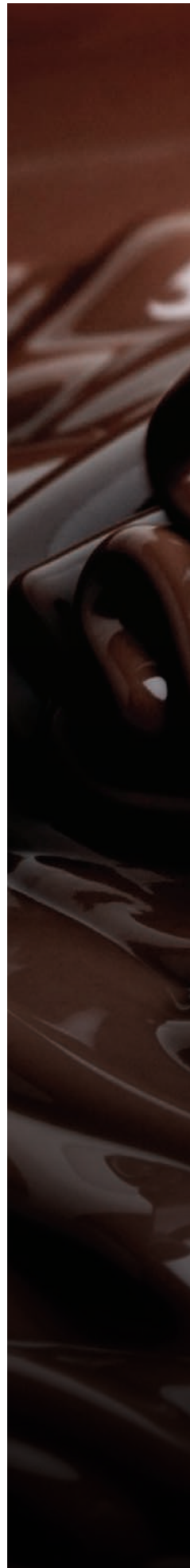
The best PGPR just got better

Palsgaard® PGPR 4190 is the newest, most advanced and functional PGPR product available on the market, designed exclusively for chocolate producers. **Palsgaard® PGPR 4190** 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. 84%, and a remarkable batch-to-batch stability, **Palsgaard® PGPR 4190** easily outperforms standard PGPR products on the market. The result is minimal variation under real life conditions guaranteeing you significant and stable viscosity reduction.

Palsgaard® PGPR 4190 works well with lecithin but offers incomparable cost-reduction possibilities when teamed up with **Palsgaard® AMP 4455** or **Palsgaard® AMP 4458**.



Viscosity Reducing Power of Palsgaard® PGPR 4190



Easy flowing chocolate

Guaranteed performance

Each individual batch of any PGPR at Palsgaard is performance tested for its viscosity-reducing power (VRP) in real chocolate. Our first-rate instrumentation, experienced personnel and standardised processes ensure trustworthy and reliable measurements.

| Product name | Cocoa butter replacement power | Viscosity reduction | Product uniformity | Clarity and taste |
|----------------------|--------------------------------|---------------------|--------------------|-------------------|
| Palsgaard® PGPR 4190 | ☆☆☆☆☆ | ☆☆☆☆☆ | ☆☆☆☆☆ | ☆☆☆☆☆ |
| Palsgaard® PGPR 4150 | ☆☆☆☆ | ☆☆☆☆ | ☆☆☆☆☆ | ☆☆☆☆ |
| Palsgaard® PGPR 4125 | ☆☆☆ | ☆☆☆ | ☆☆☆☆☆ | ☆☆☆☆ |
| Palsgaard® PGPR 4120 | ☆☆ | ☆☆ | ☆☆☆☆☆ | ☆☆☆☆ |

Perfect solutions for creamy products

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.

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.

The palm-free solution

Palsgaard® OilBinder 6121 is a new palm-free solution containing vegetable fats and mono- and diglycerides. It's PHO-free and is an excellent alternative to **Palsgaard® OilBinder 01** and **Palsgaard® OilBinder 02**.

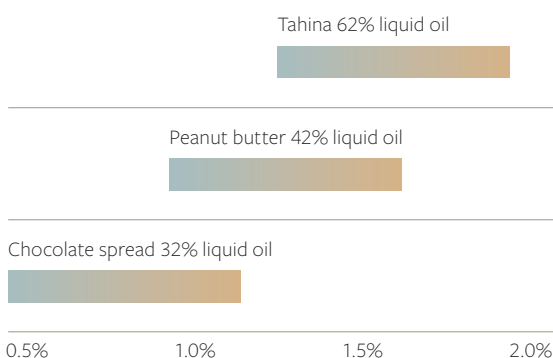
Application areas

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.

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 triglyceride 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.

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



■ Storage temperature 20-25°C ■ Storage temperature 30-35°C

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.





Innovation starts with experts


Take advantage of our unique insights into consumer trends and specific local requirements, and choose Palsgaard for your next innovative project. Our experienced food technologists are experts at adjusting recipes, optimising flow properties, reducing costs, increasing stability or achieving faster crystallisation – and they are happy to share their know-how. Our fully equipped application centres in Denmark, Turkey and Mexico provide the best bases of understanding the complex nature of chocolate and confectionery manufacturing – and are p

Choose ingredients that do good

Palsgaard is committed to acting responsibly for the good of our planet, consumers, the local communities we are a part of, and our employees. Consumers are also increasingly conscious of environmental challenges and other CSR-related topics, and all products in the **Palsgaard® AMP, PGPR, Oilbinder, and Crystal Promotor** series live up to our high standards for sustainability.

- Produced in CO₂-neutral factories
- Sourced sustainably from RSPO SG-certified palm or non-palm sources
- Produced with minimum waste, and minimum consumption of energy and water
- Handled by a responsible supply chain that lives up to all international standards

To learn more about our efforts within CSR, please visit www.palsgaard.com/CSR



Bringing good things together for over a century

The modern food emulsifier was invented by the founder of Palsgaard, Einar Viggo Schou, in 1917. Since then, we have never stopped developing and improving our products, and it is part of our DNA to keep developing yours. Bringing together your unique challenges and our drive for perfection is the recipe for a successful collaboration, and for great products that consumers love.

We also bring together the know-how of a century with a deep sense of responsibility for future generations. That's why all our production sites are CO₂-neutral and why we go to great lengths to live up to the relevant UN Sustainable Development Goals.

Learn more about our heritage and values at

palsgaard.com

Palsgaard[®]
♥ Heart working people