

EMSLAND GROUP[®]
using nature to create

Bakery





Bakery

Large super markets and wholesale stores are driving the demand of convenience bakery products. The pressure of developing more easy-to-use and semi-finished products for mass production, in addition to reducing costs, requires bakery manufacturers to seek out new innovations.

A key factor in developing the optimal product is understanding each ingredient's distinct purpose. The right ingredient can help to achieve desirable qualities in the bakery products.

Emsland Group Ingredients

Emsland Group's plant-based potato and pea ingredients can help to improve product characteristics in baked goods and bakery fillings. In bakery fillings this can be for example, texture, bake stability and mouthfeel. In baked goods our ingredients can

be used for fiber enrichment, adapt batter viscosity, aid in moisture retention and cell structure. Additionally, our products are gluten-free and can be used to develop gluten-free bakery products.





Bakery Cream Filling

Texture & Bake Stability

Industrial bakery cream filling is often produced by adding water to a mix of texturizers and milk powders. The challenge for bakery cream is that, next to texture and mouthfeel, the products should also have good bake and freeze/thaw stability. Traditionally, modified potato starch is used for this application because of the special texture and creamy mouthfeel. In order to achieve a good bake stability, ingredients such as alginate are also applied.

Next to our golden standard, **Emjel® EP 820 C**, the Emsland Group has developed **Emwaxy® JEL 300**, which is a pre-gelatinized modified starch made from waxy potato starch. This product stands out in viscosity and texture and has an improved bake stability. With the application of **Emwaxy® JEL 300**, less alginate is needed to maintain bake stability and the creamy mouthfeel of the bakery cream, especially after freezing/thawing, is improved.

Products for Bakery Cream Filling

	Emjel EP 820 C	Emwaxy JEL 300
Type	Pre-gelatinized modified potato starch (E1414)	Pre-gelatinized modified waxy potato starch (E1414)
Description	Standard product for bakery cream mixes: delivers a creamy and rich texture and has a good bake and freeze/thaw stability	Premium product for bakery cream mixes that provides a superior bake and freeze/thaw stability. It allows the reduction of alginate.

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Bakery Cream Recipe

Ingredients	Amount [%]	Amount [g]
Water	73.7	500
Powdered sugar	11.1	75
Whole milk powder	3.5	24
Skimmed milk powder	5.3	36
Pre-gelatinized starch	5.9	40
Alginate	0.5	3.5
Flavour/colour	as desired	-

Process:

- Mix dry ingredients
- Add water to a Hobart mixer
- Add dry blend to water while mixing by hand
- Stir in Hobart mixer for 3 minutes at high speed
- Let the mixture rest for 30 minutes
- Bake at 200°C for 10 minutes



Baked Goods

Dough Optimization

Potato ingredients have found their way into many baked good applications. For example, **Emjel® E 70** and **Emjel® P** can be applied to change the viscosity or structure of the dough and improve workability.

Egg Yolk Replacement

Emfix® K02 is an emulsifying starch that can be used as an egg yolk replacer in bakery applications, such as in cake and muffin mixes.

Products for Baked Goods

	Emjel E 70	Emjel P	Emfix K02	Emdex MTW
Applications	Dough	Dough	Cake mixes	Bakery glaze
Type	Pre-gelatinized native potato starch	Pre-gelatinized modified potato starch (E1412)	Pre-gelatinized modified potato starch (E1450)	Potato dextrin
Description	Increases the viscosity of the dough	Increases the viscosity of the dough and gives more structure	Emulsifying starch that can replace egg yolk in cake mixes	Potato dextrin as alternative for egg in bakery glaze



Bakery Glaze

Bakery glazes often contain egg for an optimal shine after baking. However, egg wash is expensive, the availability is sometimes challenging, there is a risk of bacterial contamination and egg is an allergen. **Emdex® MTW** is excellent for bakery glaze formulations. The potato-based dextrin has a high solubility, low viscosity and an excellent stability.

Potato Bread

A special bakery application is potato bread. Potato bread is essentially wheat bread with mashed potato or potato flakes worked into the dough. With **Emflake® 2815** or clean label **Empure® KF 1100**, a perfect potato bread can be created.

Emflake 2815	Empure KF 1100
Potato bread	Potato bread
Potato flake	Potato flake (clean label)
Medium coarse potato flake that works excellent in potato bread	Clean label alternative for potato bread

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Gluten-Free Bakery

By nature, potato and pea ingredients are gluten-free and therefore popular ingredients for gluten-free bakery products. The Emsland Group has developed gluten-free recipes for several bakery applications, such as bread, short bread cookies, sponge cake and cheesecake. For more information about our gluten-free concepts in bakery applications contact us at info@emsland-group.de.

Fiber Enrichment

Pea and potato fibers are dietary fibers that can be used to enrich bakery products. **Emfibre® EF** is the brand name for pea fiber and is available in medium and small particle size. Pea fiber has a very light colour and is the perfect choice for enrichment of white bread and biscuits. Due to the peel in potato fiber (**Emfibre® KF**), the appearance is more coloured and more similar to whole grain. Potato fiber is available in medium and coarse versions.

Pea and Potato Fiber Overview

	Emfibre EF 60	Emfibre EF 200	Emfibre KF 200	Emfibre KF 500
Type	Pea fiber	Pea fiber	Potato fiber	Potato fiber
Description	Pea fiber with small particle size and low water and fat binding properties	Pea fiber with medium coarse particle size and medium water and fat binding properties	Potato fiber with medium coarse particle size and high water and fat binding properties	Potato fiber with coarse particle size and highest water and fat binding properties in this portfolio

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Fruit Filling

Taste & Clarity

Modified starches are often used as binding and thickening agents in fruit fillings for bakery applications. The challenge for starches is that they should provide good binding that is not sticky, have a fresh non-masking taste and high clarity.

Due to low amount of lipids and protein, potato starch has a neutral taste with minimal masking and high clarity. Therefore, modified potato starches

Emjel® EP 1224 and **Emflo® 991** are excellent ingredients for bakery fruit fillings. **Emjel® EP 1224** is a pre-gelatinized product suitable for instant fruit fillings, while **Emflo® 991** is a cook-up version. A new product in the Emsland Group portfolio is **Emwaxy® HV 500**, which is made from waxy potato starch and has a high viscosity and excellent clarity due to the absence of amylose. **Emwaxy® HV 500** can also be used to replace pectin.

Products for Fruit Filling

	Emjel EP 1224	Emflo 991	Emwaxy HV 500
Type	Pre-gelatinized modified potato starch (E1414)	Cook-up modified potato starch (E1414)	Cook-up modified waxy potato starch (E1442)
Description	Product for instant fruit fillings: high viscosity, high clarity and a fresh non-masking taste	Product for cook-up fruit preparations: high viscosity, high clarity and slightly granular texture	Premium product for cook-up fruit fillings: excellent viscosity, clarity and a fresh non-masking taste

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About the Emsland Group

Using nature to create is the guiding principle of the Emsland Group. As a global leader in refined products made from potatoes and peas, we offer a wide range of innovative products with the high quality and reliability that the Emsland Group name is known for.

Our plant-based ingredients include native, clean label and modified potato and pea starches, proteins and fibers, as well as potato flakes and granules, which can be used as thickeners, binding agents, emulsifiers and stabilizing additives for various applications. We serve a variety of industries and offer solutions for trends such as clean label, kosher, halal, gluten-free, vegan, fiber enriched, sustainability, as well as non-GMO raw materials.

Innovation is a core driving force at the Emsland Group. Experts at our Innovation Centre in Germany are constantly developing and optimising products and concepts to meet the evolving demands of both the industry as well as the end user. We work closely with customers to further develop our product portfolio and overcome challenges in a sustainable way.

Sustainability is a responsibility that, for us, does not begin in the factory, but in the field. Since 1928, we have been relying on the innovative power of nature and working in harmony with our natural resources in all our endeavours. Our team is dedicated to continuously working to develop products that are in line with newer sustainability benchmarks, helping to drive the global trend towards more environmentally friendly and sustainable options through the production of plant-based solutions.

The Emsland Group offers product solutions for the following food segments:

- Bakery
- Confectionary
- Dairy & Alternatives
- Food Coating
- Meat Analogues
- Meat, Poultry & Seafood
- Noodles & Gluten-Free Pasta
- Potato Products
- Potato Snacks
- Retail & Food Service
- Soups & Sauces

The table below offers an overview of the most common applications of our products in all food segments. For more complete information on the Emsland Group's products and applications, please contact us at info@emsland-group.de.

Ingredients	Functionality	Food applications
Potato flakes <i>Emflake</i>	Texturizing, expansion, forming	Snacks, potato products, bakery
Potato granules <i>Emgranule</i>	Texturizing, expansion, forming	Snacks
Native pea and potato starch	Thickening, texturizing, water binding, expansion, anti-caking	Soups, sauces, noodles, meat, snacks, gluten-free products
Modified pea and potato starches <i>Emes, Emflo, Emden, Emox</i>	Thickening, texturizing, gelling, binding, expansion, forming	Snacks, soups, sauces, confectionary, food coating, baked goods, processed cheese and alternatives, meat and analogues, noodles
Cold water swelling or soluble native and modified starches <i>Emjel, Emfix</i>	Instant thickening, texturizing, binding, emulsifying	Snacks, soups, sauces, bakery fillings, baked goods, cheese and alternatives
Potato and pea dextrins <i>Emdex</i>	Film forming, texturizing (crispiness)	Food coating, filler, binder
Clean label pea and potato starches <i>Empure</i>	Thickening, gelling, texturizing, binding	Soups, sauces, potato products, meat analogues
Waxy potato starch <i>Emwaxy</i>	Expansion, thickening, texturizing	Snacks, meat, noodles, cheese alternatives, fruit preparations, bakery fillings
Pea protein isolate <i>Empro</i>	Nutrition (protein enrichment), texturizing, emulsification	Meat analogues, dairy alternatives, bakery, snacks
Pea and potato fiber <i>Emfibre</i>	Nutrition (dietary fiber, water and fat binding)	Meat and analogues, bakery, snacks
Blends <i>Embat</i>	Film forming, texturizing	French fry coating, tempura & adhesion batter

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The Emsland Group is committed to producing consistently high-quality ingredients. Customer health and safety, as well as transparency regarding our manufacturing methods, are top priorities.

To view a complete list of our certifications and qualifications, scan the QR code or visit www.Emsland-Group.com





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Disclaimer: All information and data in this brochure are in accordance with the best practise experiences and laboratory examinations of Emsland-Stärke GmbH and Emsland Food GmbH hereafter called Emsland Group. The indications are based on the current state of development, technology and research and should be taken as information on the products of Emsland Group, but must not be understood as promise of characteristics.

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