



EMSLAND GROUP[®]
using nature to create

Dairy and Dairy Alternatives



Dairy & Dairy Alternatives

Dairy products are an important part of most consumers' food and beverage purchasing habits. The booming trend of plant-based alternatives has meant growth in the demand for dairy alternative products

as well. These products are not only unique due to their composition but also due to the equipment and the processes that are used to produce them.

Emsland Group Ingredients

Emsland Group starches and proteins can be applied to dairy and dairy alternatives such as vegan and processed cheese, puddings, desserts, drinks and ice

cream to achieve various goals, including thickening, stabilizing, texturizing, cost reduction or nutritional enhancement.

Products for Vegan and Processed Cheese

	Dried native potato starch	Emes KSA 1052	Emox C 70 S	Emflo 991
Type	Native potato starch	Cook-up modified potato starch (E1420)	Cook-up modified potato starch (E1404)	Cook-up modified potato starch (E1414)
Description	Anti-caking agent in shredded cheese. Emsland Group offers different moisture levels from 6 to 14 %	Gelling starch that can replace part of caseinate in processed cheese	Gelling starch that has excellent melt properties. It is very suitable for vegan cheese	Modified potato starch that adds flexibility when used with Emox C 70 S in vegan cheese. It can be used to fine-tune the texture and firmness of processed and vegan cheese



Vegan and Processed Cheese

Texture & Nutrition

The use of starches in processed cheese and cheese analogues is well known in the industry. Starches are used to provide the desired texture and characteristics such as shredding properties and melting. An economical texturizing solution is key to the success in this category.

The popularity of plant-based foods has led to increased popularity of vegan cheese within the processed cheese market. Vegan cheese is often made with water, fat or oil, emulsifiers and texturizers. The challenge for vegan cheese is the nutritional profile – the level of protein is much lower than in dairy cheese.

The Emsland Group's portfolio for vegan and processed cheese consists of traditional gelling starches **Emox® C 70 S** and **Emes® KSA 1052** for

partial replacement of caseinate. By using combinations of **Emox® C 70 S** with **Emflo® 991**, **Emden® ESH 15** and emulsifying starch **Emfix® K02**, vegan recipes are possible where properties such as firmness, shredding, melting and slicing functionality can be customized. **Emden® ET 50** is a blend that is very suitable for slices as it adds flexibility and has very low stickiness. With **Emwaxy® 100** and **Empro® E 86 HV** a high melting clean label vegan cheese can be created. The nutritional profile of vegan cheese can also be improved by using **Empro® E86 HV**.

Next to these texturizing and nutritional solutions, the Emsland Group offers a variety of dried potato starches with different moisture content to be used as anti-caking agents, preventing cheese shreds from lumping.

Emden ESH 15	Emden ET 50	Emwaxy 100	Emfix K 02	Empro E86 HV
Cook-up modified pea starch (E1440)	Cook-up modified starch (E1442)	Native waxy potato starch	Cold water binding modified emulsifying potato starch (E1450)	Pea protein isolate with minimum 84 % protein content

Gelling starch that provides soft texture, low melt, with a more flexible, elastic texture compared to **Emox C 70 S**. Very suitable for shredding

Gelling starch, that provides low melt, high flexibility and low stickiness. Very suitable for slicing

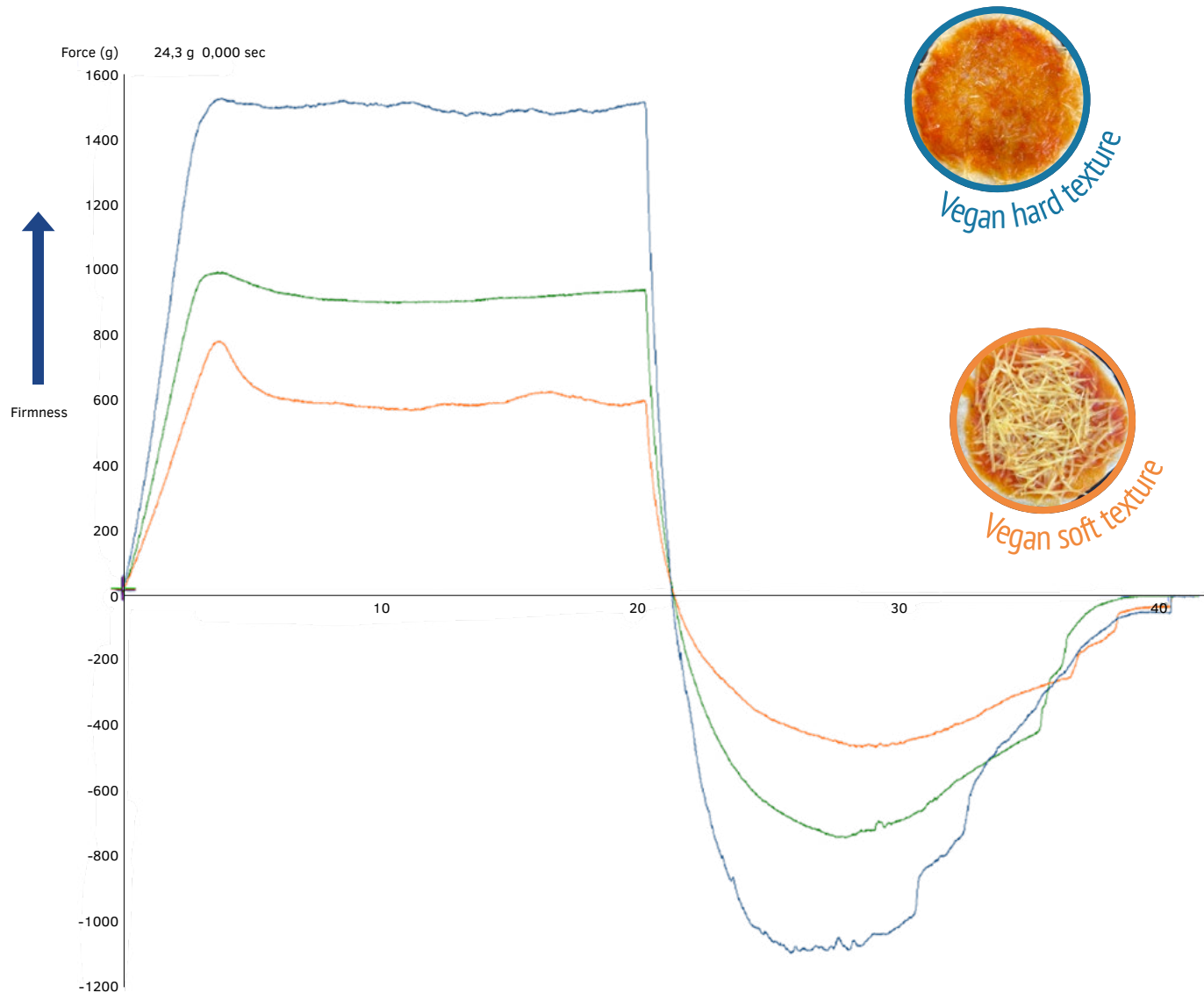
Starch that adds melting and stretching properties to vegan cheese, especially in combination with **Empro E 86 HV**

Emulsifier based on potato starch that supports the cheese emulsion during cooking and cooling


Clean label emulsifier

All products are registered®

Texture Toolbox for Vegan Cheese



Cheese	Vegan pizza cheese, soft texture	Vegan pizza cheese, medium hard texture	Vegan pizza cheese, hard texture	Vegan parmesan
Products	Emes ESH 15, Emfix K02	Emox C 70 S, Emflo 991, Emfix K02	Emox C 70 S, Emfix K02	Emox C 70 S, Emfix K02
Special properties, starch functionalities	Very flexible shreds, less breakage, low melt properties	Excellent melt properties, good shredding properties	Good melt properties, good shredding properties	Hard cheese, not sticky



Vegan medium texture


■ Vegan hard texture

■ Vegan medium texture


■ Vegan soft texture

50


Time (sec)



Vegan sliceable cheese



Vegan grilled cheese



Vegan parmesan

Vegan sliceable cheese	Vegan grilled cheese
Emox C 70 S, Emflo 991, Emfix K02 or Emden ET 50	Emwaxy 100, Empro E 86 HV
Low melt, excellent flexibility. Emden ET 50 has very low stickiness and very good slicing properties	Good melt and stretch, clean label

All products are registered®



Instant Puddings and Desserts

Smooth & Creamy

Instant puddings and desserts are known for their spoonable and creamy texture as well as clean flavour profile.

Instant starches based on potato starch are very popular and effective in cream puddings and desserts due to the clean taste, high viscosity and excellent

texture. The Emsland Group offers **Emjel®** instant modified potato starches as well as a clean label alternative, **Empure® KJEL 200**.

For bake stable cream fillings, see our Bakery brochure.



Products for Instant Puddings and Desserts

	Emjel P	Emjel EP 300	Empure KJEL 200
Type	Pre-gelatinized modified potato starch (E1412)	Pre-gelatinized modified potato starch (E1414)	Pre-gelatinized clean label potato starch
Description	Standard modified starch for instant puddings and dessert providing creamy, high viscous, spoonable texture	Modified starch that provides premium viscosity and texture	Clean label solution for instant puddings and desserts

All products are registered®

Nutritious Dairy Alternatives

Delicious & Nutritious

One of the biggest challenges in developing dairy alternatives is achieving a similar nutritional profile as their dairy counterparts, without the use of milk proteins. That is why the Emsland Group has developed pea protein-enriched concepts for plant-based cheese, drinks and ice cream.

Empro® E 86 and **Empro® E 86 HV** are pea protein isolates with minimum 84% protein. They have a good nutritional profile and are well suited for enhancing protein content in dairy alternatives.

Pea Proteins for Protein Enrichment

	Empro E 86	Empro E 86 HV
Type	Pea protein isolate with minimum 84 % protein content	Pea protein isolate with minimum 84 % protein content
Description	Standard pea protein isolate with a good nutritional profile	Functional pea protein isolate with a high viscosity and improved solubility

All products are registered®

Concepts for Pea Protein Enrichment

Application	Plant-based drinks (RTD)	Plant-based ice cream	Plant-based cheese
Product	Empro E 86 HV	Empro E 86 HV	Empro E 86
Level of enrichment	4.2 %	4.6 %	7.8 %

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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

All products are registered®

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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