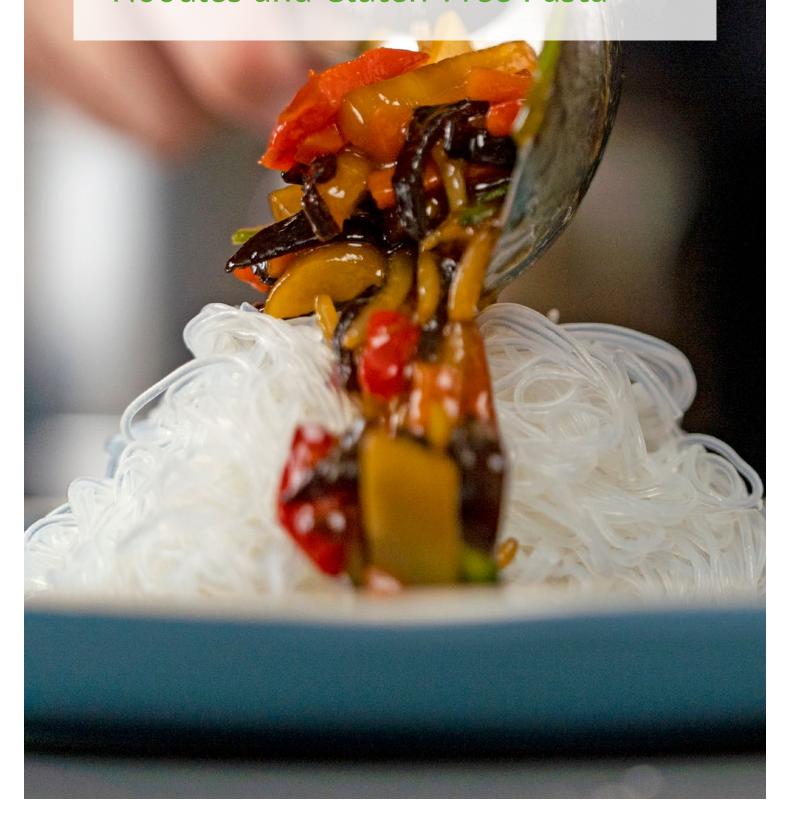


Noodles and Gluten-Free Pasta





Noodles & Gluten-Free Pasta

Noodles are consumed around the globe in many different forms, textures and tastes, often varying depending on the region. In addition to being a convenient food, noodle consumers are looking for a product with a higher quality and nutritional content.

Whether producing instant noodles, glass noodles, frozen noodles or chilled noodles, manufacturers must source a broad range of raw materials, with each ingredient playing a key role in the outcome of

the product. Starches can be applied to noodle products to enhance noodle texture, improve clarity and achieve faster rehydration.

Gluten-free food products such as gluten-free pasta remain popular food products for consumers. The largest challenges for gluten-free pasta manufacturers is achieving the right texture and high-quality product while managing the costs and nutritional content.

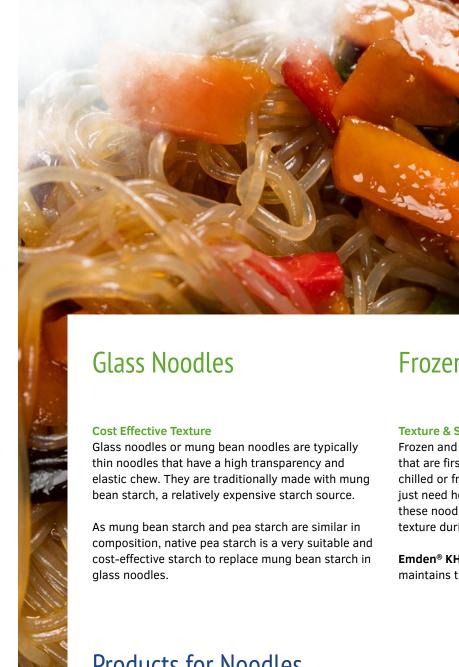
Instant Noodles

Texture & Hydration

Instant noodles are precooked and dried noodles that are prepared by soaking in boiling water before eating. Therefore, easy hydration and a good water-holding capacity is very important. The typical texture of instant noodles is elastic and slippery. The main ingredient for instant noodles is wheat flour, which gives a short texture to the noodles. However, easy hydration as well as the typical elastic texture are challenging to obtain with wheat flour.

Native potato starch or modified potato starch, such as Emes® EE, are commonly used to enhance the gelling properties and hydration of the noodle. The gelling properties give the noodle the typical elastic and slippery texture.





Frozen and Chilled Noodles

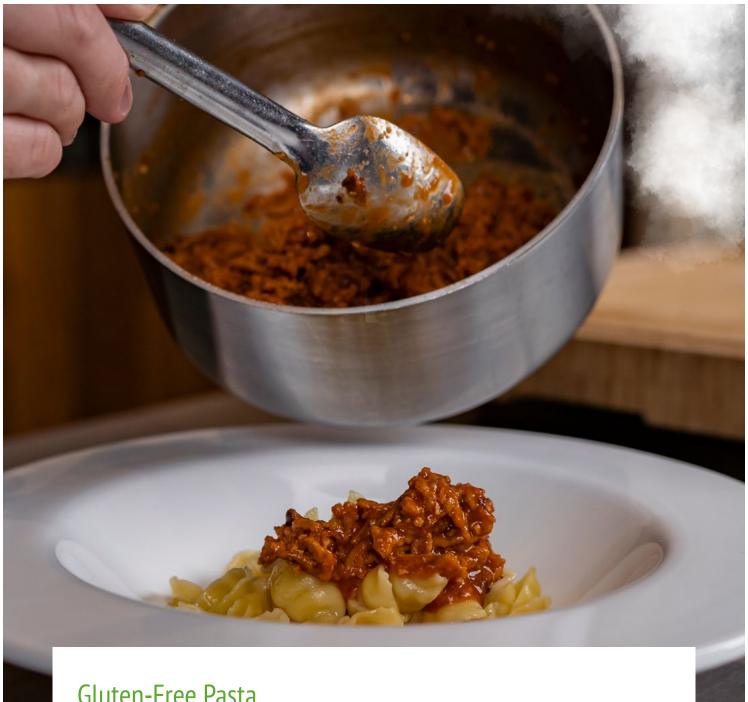
Texture & Shelf Life

Frozen and chilled noodles are thick elastic noodles that are first cooked to completion and subsequently chilled or frozen. These noodles are ready-to-use and just need heating in boiling water. The challenge for these noodles is to maintain the elastic non-sticky texture during shelf life.

Emden® KH 15 is a modified potato starch that maintains the texture of frozen and chilled noodles.

Products for Noodles

	Potato starch	PS 2100	Emes EE	Pea starch	Emden KH 15
Applications	Instant noodles	Instant noodles	Instant noodles	Glass noodles	Frozen and chilled noodles
Туре	Native potato starch	Native potato starch	Cook-up modified potato starch (E1420)	Native pea starch	Cook-up modified potato starch (E1440)
Description	Provides good hydration properties and elastic texture	Specialty starch with improved hydration properties	Provides premium hydration and elastic texture	Replacement for mung bean starch in glass noodles	Stabilizes the texture of frozen and chilled noodles after prolonged shelf life



Gluten-Free Pasta

Gluten-free food products, such as gluten-free pasta, remain popular food products. This accounts for people who suffer from coeliac but also for people that are gluten intolerant or those who wish to limit gluten levels in their diet.

Formation of the gluten protein network is fundamental for the texture and quality of pasta and this is the largest challenge for gluten-free pasta. Other challenges are price and nutrition.

Potato flakes and other potato ingredients are excellent ingredients for gluten-free pasta recipes, as they are free from allergens and have good binding and nutrition properties.

The Emsland Group has developed various recipes for gluten-free pasta. Next to potato flakes, these recipes also contain Emsland Group potato granules, starches and proteins. For more information contact us at info@emsland-group.de.



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 Emgranule	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 Emes, Emflo, Emden, Emox	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 Emjel, Emfix	Instant thickening, texturizing, binding, emulsifying	Snacks, soups, sauces, bakery fillings, baked goods, cheese and alternatives	
Potato and pea dextrins Emdex	Film forming, texturizing (crispiness)	Food coating, filler, binder	
Clean label pea and potato starches Empure	Thickening, gelling, texturizing, binding	Soups, sauces, potato products, meat analogues	
Waxy potato starch Emwaxy	Expansion, thickening, texturizing	Snacks, meat, noodles, cheese alternatives, fruit preparations, bakery fillings	
Pea protein isolate Empro	Nutrition (protein enrichment), texturizing, emulsification	Meat analogues, dairy alternatives, bakery, snacks	
Pea and potato fiber Emfibre	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	

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





Contact Us

Emsland-Group.com +49 5943810 info@emsland-group.de Emslandstrasse 58 49824 Emlichheim Germany

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.

Emsland Group cannot assume liability for the product information and products, as the conditions under which the stocking, treatment and processing occur are out of the control of Emsland Group.

Liability claims against Emsland Group which refer to material or immaterial damages caused by the use or disuse of the offered products and product information of Emsland Group are basically exempted, unless demonstrably intended or grossly negligent fault exists which directly caused the damage. In particular Emsland Group assumes no liability that the offered products or product information are economically utilizable, technically executable or useful or that the offered products and product information do not infringe the rights of third persons.