



MODIFIED STARCH FOR FOOD

COMPANY PROFILE

We, NUTREND BIOTECH CO., LTD. and our joint venture partner FOSHAN HUAHAO HUAFENG STARCH CO., LTD. are the leading modified starches manufacturer in China. With decades of experience in starch, we devoted ourselves to develop and manufacture a wide range of modified starches, not only tapioca based, also potato, waxy maize, maize, pea based to help you to meet your challenges from food industry, and other industries e.g. textile, construction, paper, oil drilling etc. as well.

For food industry, there is an increasing demand of a variety of modified starches to develop and diversify foods to catch up with the trends in taste, safety, health and nutrition. We have good experience and technology to modify the native starches from various plant origins by a variety of modification process, including cross-link, pregelatinization, oxidization, thin-boiling, and combination of modifications. Based on this wide range of modified starches with various characteristics, it makes possibility for you to achieve a product with desired unique texture, stability, appearance, taste and cost-optimization.

Not only to deliver the products you need, we always deliver our add-valued services to you, in terms of technical support, quality assurance, and logistics.

Technical Support -- We have good technical team with great manufacturing experience and know-how of applications, to work with you together. With deep understanding of your applications, we are happy to provide advices about the best choice of modified starch and solution, possible improvement, benefits and changes in your processing and final products to innovate new products or improve your current recipe, cost and processes.

Quality Assurance -- We always highlight quality and safety as the priority of our stands of manufacturing and our promise to you. We have accredited quality assurance system and state of the art production facility to ensure the product quality and safety covering the whole processing and supply chain, from the approval and receipt of raw material to final product storage and delivery. We also have QA protocols and traceability system to verify the product quality and response to any quality issue to each batch of product.

Logistics -- We have a professional logistic team to make us enable to deliver your goods exactly to agreed schedule and destinations. Our logistic team will understand your needs to provide a best shipping plan, and keep you informed about the each step of delivery to ensure you receive the goods on time.

In early 2013, we started a new production facility with annual capacity of 40,000MT. This makes us flexibility and capability to supply traditional modified starches and develop advanced specialties. We expect to work with you to fulfill the demand from food industry and supply the delicious foods to consumers world widely.



MODIFIED STARCH FOR BAKERY

Bakery is the major sector of food industry, deliver quite a diversified bakery foods to satisfy consumers demand. We have decades of experience of developing modified starches to cover a broad range of bakery products, including baked foods, biscuits, desserts, fillings. Our bakery range modified starches, have developed a variety of CWS starches and cook up starches to meet various processing demands. These bakery modified starches play important roles in dough building, water binding, texturizing and lead to desired texture, freeze-thaw stability, mouthfeel, extended shelf-life of the products.

Modified Starch	Type	Functionality	Applications
NuStar T42-QQ E1442	Cook up	Increase water binding capacity Dough building Improve dough stability and elasticity	Breads Bakery mixes
NuGel T42 E1442	CWS	Increase water binding capacity Keep the light structure and mouthfeel Extend shelf-life	Muffins Cakes Bakery mixes
NuGel T42-F2 E1442	CWS	Increase water binding capacity Improve texture and bite mouthfeel	Pancake Dorayaki
NuGel P14 E1414	CWS	Good water swelling Short and smooth structure Good heat stability and shape retaining	Instant custard powder Bakery mixes
NuStar T42-78 E1442	Cook up	Good clarity Good thickening and elasticity Heat and freeze/thaw stable	Fruit fillings
NuStar M22 E1422	Cook up	Short and smooth structure Heat and freeze/thaw stable Good clarity and shine	Fruit fillings Other bakery fillings
NuGel MT42 E1442	CWS	Good emulsifying Balance the oil distribution in dough Keep texture and freshness of high oil bakery foods	Sponge cakes Baking dressing
NuGel M Pregel only	CWS	Good water binding Improve crispy texture	Shortbread biscuits Cookies
NuGel P / T / C Pregel only	CWS	Good water binding Improve crunch texture	Crackers Cookies

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MODIFIED STARCH FOR SNACKS

We have good experience in developing a range of modified starches to translate customers' desires into delectable snack foods, including coated nuts, directly expanded snacks, fried expanded pellets, stackable/formed chips, baked snacks, etc.

Our snack modified starches range contains pregelatinized starches, cross-linked pregelatinized starches and cook-up starches, which can enable our customers to diversify snack foods with desired expansion, texture, crunch, appearance etc. The pregelatinized (cross-linked) starches act as a good moisture distributor and binder in the premix, and give extrusion capability, firm texture and shape of the snacks. The cook-up starch improve the stability, controlled expansion and crispy texture of the snacks. Our snack modified starches also give our customers options of starch origin, including tapioca, potato, waxy maize, depending on requirements on processing, texture, and flavors.

Modified Starch	Type	Functionality	Applications
NuGel M20 E1420 NuGel M Pregel only	CWS	Good adhesive in the premix High expansion Soft crispy bite texture White appearance	Coated nuts
NuGel T Pregel only	CWS	Good adhesive in the premix High expansion Hard crunchy bite texture	Coated nuts
NuGel T12 E1412	CWS	Good tolerance to extrusion High water binding capability Build firm texture Good shape holding and low breakage Crunchy bite texture	Potato chips French fries Curly fries
NuStar P20 E1420 NuStar T20 E1420	Cook up	Extension control in frying and baking Soft crispy bite texture	Instant Noodles Fresh Noodles

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MODIFIED STARCH FOR SAUCES & DAIRY

We have developed a series of modified waxy maize starch for fluid or semi-fluid convenient foods, ranging from cooking sauces (e.g. soya sauce, oyster sauce), dairy like yogurt, and emulsions like mayonnaise, to ketchup, etc. These modified starches act as excellent thickener and stabilizer to improve texture, stability, mouth-feel and appearance of above foods. This range of modified starches give flexibility to customers to use for both hot and cold prepared products, to satisfy the processing needs due to functions and advantages as follows:

- Viscosity and texture build-up
- Enhance stability against heat, acid, shear and homogeneous processes
- Provide pulpy to shiny body and creamy mouthfeel
- High clarity and glaze of appearance
- Freeze-thaw stable
- Extend shelf-life

	NuStar M42-20 E1442	NuStar M42-10 E1442	NuStar M22 E1422	NuStar M22-C E1422	NuGel M22 E1422
Salt Stability	*****	*****	***	***	***
pH Stability	***	***	*****	*****	*****
Shear Stability	***	*****	*****	**	*****
Clarity	*****	*****	***	***	***
Freeze-thaw Stability	*****	*****	***	***	***
Flowability	*****	*****	****	***	*
Applications	Fruit jam Oyster oil Abalone sauce Dairy, Yogurt	Fruit jam Abalone sauce Dairy, Yogurt	Ketchup Fruit jam Soya sauce	Ketchup Tomato paste Oyster oil	Salad dressing Mayonnaise

Note: * Low ***** High

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MODIFIED STARCH FOR CONFECTIONARY

We have good experience for years to provide modified starch solutions to assist our customers to create a variety of confectionaries, including gum jellies, chewy candy, marshmallows and aerated confections, etc. We have developed a range of modified starches, with various characteristics of clarity, viscosity, elasticity, gelling properties, etc. Therefore, we can achieve various texture solutions to our customers, from an elastic gelatin-like texture to a soft, chewy feel by this rang of modified starches. It makes possibility to diversify a wide range of products with unique texture created by our modified starch to satisfy consumers prefer.

Apart from a good texture agent, our modified starches can satisfy a wide range of confectionary processes, and also favorable to our customers to extend shelf-life, save cost, etc. For example, the thin-boiling starches can be used in high concentration to save stoving time and elevate production capacity, due to its low viscosity at high temperature. The starches with fast gelling property are used as good gelling agent to fully or partially replace gelatin and arabic gum.

	NuStar C01 E1401	NuStar E20 E1420	NuStar T42-78 E1442	NuGel T / C Pregel only	NuGel M22 E1422
Gelling	Yes	Yes	No	No	No
Gelling Speed	****	****	N/A	N/A	N/A
Acid Stability	***	**	***	*	****
Aeration	No	No	Yes	No	Yes
Mouthfeel	Elastic	Soft Elastic	Shape retain	Chewy	Chewy
Shelf Life	****	***	****	***	****
Applications	gelatin jelly starch jelly	gelatin jelly starch jelly	Candy (low aerated)	chewing gum	chewing gum Candy (low aerated)

Note: Gelling Speed: * Slow **** Quick
 Acid Stability: * Low **** High
 Shelf Life: * Short **** Long

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MODIFIED STARCH FOR FLAVOR, ENCAPSULATION

Flavor and seasonings are the important ingredients for food industry to satisfy the consumers by attractive taste and flavor. Protect flavor from degrading and controlled flavor release are the critical challenges for flavor and seasoning manufacturers. We have developed an OSA modified starch as a cost-effective solution to protect flavor oil from degradation, oxidation, and volatile evaporation, by encapsulating the flavor oil/fat into spray dried powder due to its excellent emulsification and retention property. This encapsulated powder is also an effective way of flavor dispersion and instant release, and it provides ease of handling and incorporation into dry food recipes.

We have a range of other modified starches developed for flavor and seasonings sector as well, providing emulsifying, thickening, retention effects to the product, achieve the flavors and seasonings with desired texture, stability and flavor release as the consumers prefer. This range of modified starches also give cost-effective options to customers to substitute traditional high cost ingredients like arabic gum and gelatin, etc.

Modified Starch	Viscosity	Functionality	Application
NuGel M50-03 E1450	Very low	Good emulsification; Good film-forming property; Low viscosity to ease spray drying.	Oil/fat encapsulation; Flavor; Fat-soluble vitamin.
NuGel M50-46 E1450	Moderate	High emulsibility (up to 50 times); Good stabilizer and thickener in oil/water system; Good resistance to salt, heat, shear; Replace egg yolk.	Mayonnaise; Sauce and condiment with high oil/fat content; Soup stock
NuGel M50-100 E1450	Between M50-46 and M50-15	Good water solubility; Good emulsibility; Good encapsulation capability Effective protection on thermosensitive substances.	Fat-soluble vitamins preparations; Flavour oil/essential oil encapsulation.
NuGel M50-15 E1450	Low	High emulsibility; Low viscosity to ease spray drying; Effective oxidation protection.	Vitamins microencapsulation

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