DSM GELLAN GUM

IMAGINE TEXTURE AND POSSIBILITIES

Introduction

Gellan gum is a naturally occurring polysaccharide widely used in food, beverage, industrial and consumer applications mainly as a gelling or suspension agent. Gellan gum is an approved food additive in the US, EU, Japan, and many other countries with "not specified" ADI (Acceptable Daily Intake) rating by both JECFA and EFSA. For pharmaceutical and industrial uses, gellan gum appears in the USP/NF as well as US TSCA inventory and European EINECS. Gellan gum is labeled as "E418" (EU) or "gellan gum".

Native gellan gum has been approved as organic-compliant by the USDA since 2010. Due to its functional potency, label friendliness, and cost-in-use competitiveness, gellan gum is often used as a clean label replacement for other hydrocolloids such as carrageenan, gelatin, modified starch and amidated pectin, especially in natural and organic food products.

Structure of Gellan Gum

Gellan gum is a linear anionic polysaccharide consisting of repeating tetra-saccharide units. Commercial gellan gum, depending on the forms, typically has a molecular weight of about $2x10^5$-$2x10^6$ Da. In water gellan gum molecules crosslink to form a 3-dimensional network at a concentration as low as 200 ppm, giving rise to its unique "fluid gel" rheological properties. The molecular properties of gellan gum have profound impact on its performance.

DSM Gellan Gum

With over 100 years of fermentation knowledge, we at DSM produce gellan gum with consistent quality from the natural microorganism Pseudomonas elodea. All DSM gellan gum products are produced from this non-GMO strain without the use of genetic modifications of any kind.

DSM offers a comprehensive gellan gum product portfolio including both the low acyl (LA) and high acyl (HA) types.

The LA type: With unrivaled gel strength, water-like clarity, and robust heat tolerance, DSM's LA products deliver superior functionalities in a wide range of applications as suspension, structuring, and texturizing agents.
The HA type: DSM's advanced HA portfolio consists of tailor-made products designed specifically to match the functional needs of a wide variety of applications, especially protein-containing systems. At very low use levels, DSM's HA products deliver consistent and reliable stability, superior syneresis control and unique mouthfeel enhancement.

Gellan Gum Features and Benefits

Key feature	Benefits
Gelling at very low concentrations	• Cost effective • Excellent flavor release • Refreshing mouthfeel • Great syneresis control at low dosages
Highly pseudoplastic (shear-thinning) rheology	• Excellent suspension with minimal impact on mouthfeel • Easy to pump and process
Heat-stable gels (LA)	• Heat stability at elevated temperature during pasteurization and under severe storage conditions
Low protein reactivity (HA)	• Suitable for a wide variety of protein systems such as dairy and plant protein drinks • Compatible with high protein systems

DSM Advantage and Leading Competences

Fermentation: Consistent and robust gellan gum quality starts from the source. DSM is the cradle of modern industrial bio-production. With over 100 years of fermentation knowledge, more than 400 DSM scientists globally work on developing bio-based processes and products. DSM's gellan gum technology benefits from such industry-leading fermentation expertise.

Product testing: In-depth understanding of each production batch is essential to superior application performance. All DSM gellan gum products are tested using not only industry standard test methods but also proprietary tests developed by DSM to ensure consistent performance in the intended applications.

Open innovation: It's a different era, today's innovation needs to be open and agile. The DSM Global R&D Center for Hydrocolloids is home to our state-of-the-art labs and pilot plant for both application and process development. Our innovation team works intimately with leading customers around the globe to develop new products and new applications with speed and precision.

Peace of mind: DSM has been ranked seven times as world No.1 in the Dow Jones Sustainability World Index for materials industry group. Sustainable and reliable supply is ensured by our comprehensive e orts to environment, safety, and labor responsibilities. All DSM gellan gum products are produced according to FSSC 22000 and ISO 9001, and are Non-GMO, Kosher and Halal certified.

Key Applications

Plant protein drinks. In the US, soy and almond drinks are still the most popular milk alternatives, but others are emerging, including coconut, pea, cashew, quinoa, hazelnut, and spelt. In Europe, grains like amaranth and teff are also gaining traction. DSM's **Gellan Gum ND-102** provides a robust suspension system for plant-based drinks, stabilizing minerals and insoluble fiber.

Dairy drinks. The demand for high-protein, ready-to-consume trend is driving growth in dairy drinks. Today, more than 40% of new dairy drinks launched in the US have high protein contents. DSM's Gellan **Gum ND-103** is a high acyl (HA) type gellan gum recommended for use as a suspension agent and mouthfeel enhancer in neutral dairy protein beverages. **Gellan Gum ND-103** can be used in combination with other hydrocolloids to give different textures and mouthfeels.

Creamers. Plant-based creamers offer coffee lovers a non-dairy alternative without compromising the creamy mouthfeel typically associated with regular creamers. Enabled by gellan gum's unique stabilizing functionalities, plant-based creamers can be produced in either chilled or shelf-stable format. DSM's **Gellan Gum ND-102** is compatible with all-vegan plant-based creamers whereas **Gellan Gum ND-103** is designed to perform in regular dairy creamers.

Yogurt. DSM offers gellan gum products tailored for a variety of yogurt applications including stirred yogurt, yogurt drinks, Greek yogurt, and shelf-stable ambient yogurt. DSM's **Gellan Gum ND-101** provides a clean label solution to improve key yogurt attributes such as mouthfeel (smooth but not slimy, rich but not pasty) and syneresis control, especially in recipes with low-fat and high-protein. DSM's **Gellan Gum YF** is compatible with pasteurized ambient yogurt.

Yogurt fruit preparations. A high-performance gelling agent with unique rheological properties, gellan gum can be used in yogurt fruit preparations (YFP) to replace part or all of the conventional stabilizers such as modified starch and amidated pectin. DSM's **Gellan Gum FP** is a cost-effective texturizing agent for YFP, delivering cost savings while providing excellent YFP attributes such as even fruit distribution, syneresis control, easy stir-in, great flavor release and pleasant mouthfeel.

Bake-stable fillings. DSM gellan gum helps reduce cost in bake-stable fillings by replacing conventional pectin solutions and/or reducing sugar dosage. DSM's **Gellan Gum HP** can be used alone or in combination with starch to produce bake-stable fillings with refreshing mouthfeel and excellent sheen. We also offer other gellan gum solutions for bakery applications such as post-bake icing and glaze.

Dessert gels. DSM's **Gellan Gum WJ** is tailored for use in water jelly applications, giving water dessert jellies a delicate and brittle texture with pleasant mouthfeel and excellent flavor release. **Gellan Gum WJ** can also impart heat stability to multi-layered water jellies during pasteurization. **Gellan Gum WJ** can be used alone or in combination with other hydrocolloids such as carrageenan, konjac glucomannan, locust bean gum and xanthan gum to give a wide range of textures.

Fruit-flavored drinks with pulps. At very low dosages, DSM **Gellan Gum** can provide a unique suspension system with a refreshing mouthfeel for fruit-flavored drinks with pulps such as aloe vera.

DSM Offers a Full-range of Gellan Gum Products

Product Type	Product Name	Applications	Typical Use Levels
LA	Gellan Gum	Bake-stable jam and fillings, confectionaries, water jellies, bakery applications, juice drinks and alcoholic beverages	0.015 – 0.4 %
	Gellan Gum HP	High performance applications of bake-stable jam and fillings, confectionaries, water jellies, bakery applications	0.012 – 0.4 %
	Gellan Gum WJ	Water jellies	0.03 – 0.3 %
HA	Gellan Gum HD	Juice drinks, dysphagia food	0.02 – 0.1 %
	Gellan Gum ND-101	Yogurt	0.02 - 0.06 %
	Gellan Gum ND-102	Plant-protein drinks	0.02 - 0.04 %
	Gellan Gum ND-103	Neutral dairy beverage	0.02 - 0.04 %
	Gellan Gum YF	Ambient yogurt	0.025 - 0.05 %
	Gellan Gum FP	Yogurt fruit preparations	0.03 - 0.12 %

DSM Hydrocolloids

For further information, please see:
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