Organic Cornstarch Powder

What is organic cornstarch powder?

Organic Cornstarch Powder (INCI: *Zea Mays Starch*; CAS: 9005-25-8; HS Code: 1108.12.0000) is a refined carbohydrate polymer isolated from the endosperm of organic, non-GMO corn (*Zea mays* L.) through mechanical wet milling — a physical separation process that isolates the starch granule without chemical modification or solvent-based refining.

The starch granule is composed of two glucose polymers: **amylopectin** (approximately 73–77%), a highly branched structure responsible for gel strength and viscosity, and **amylose** (approximately 23–27%), a linear polymer that contributes to gel firmness and film-forming properties. This amylose-to-amylopectin ratio defines organic cornstarch's characteristic textural profile — a "short," smooth gel with moderate clarity — distinguishing it from other commercial starches.

Processing: Mechanical Wet Milling

Mechanical wet milling physically fractionates the corn kernel into its anatomical components — germ (oil-rich), pericarp (fiber), and endosperm (starch-dense) — using water, mechanical force, and density separation. No sulfur dioxide steep liquor, no enzyme treatments, and no solvent extraction are used in the organic process, consistent with organic certification standards.

Why Endosperm Fraction Matters

The endosperm is the starch-dense portion of the corn kernel. Physical separation of this fraction ensures:

- Minimal protein content (≤0.5% crude protein) — critical for transparent paste clarity in sauces and pie fillings
- Low lipid content — prevents off-flavors and oxidative rancidity during storage
- Clean amylose/amylopectin ratio — consistent gelatinization behavior batch-to-batch

Clean-Label Positioning

Organic Cornstarch Powder carries no E-numbers, requires no label statement beyond its common name ("Corn Starch"), and is suitable for front-of-pack clean-label declarations. It is the preferred thickening agent for manufacturers reformulating away from modified starches (E1404–E1452), synthetic thickeners, or talc extenders.

Certifications Available USDA Organic, Non-GMO Project Verified, Vegan, Gluten-Free, Kosher. Halal certification — confirm with sales.

Minimum Order Quantity Sample quantities available for specification verification. Commercial volumes in 25 kg kraft paper bags. Bulk 20 MT containers available. Contact sales@organic-way.com for quotation.

PHYSICAL & CHEMICAL PROPERTIES

Standard Specifications

Parameter	Specification	Test Method
Common Names	Organic Corn Starch, Organic Maize Starch, Corn Flour (UK/AU)	—
INCI Name	Zea Mays Starch	—
CAS Number	9005-25-8	—
EINECS	232-679-6	—
HS Code	1108.12.0000	—

Parameter	Specification	Test Method
Source	100% Organic Non-GMO Corn (*Zea mays* L.), endosperm	—
Appearance	Ultra-fine, bright white powder; free-flowing	Visual
Starch Content	≥98% (dry basis)	Polarimetry / HPLC
Amylose Content	23–27%	Iodine Colorimetry / ISO 6647
Amylopectin Content	73–77%	Calculated
Moisture Content	≤12%	ISO 1666 / AOAC 930.04
Ash Content	≤0.1%	ISO 3593 / AOAC 942.05
Crude Protein	≤0.5%	ISO 5983 / AOAC 990.03
Fat Content	≤0.3%	ISO 8292 / AOAC 920.39
pH (10% suspension)	4.5–6.5	Potentiometric
Gelatinization Temperature	62–72°C (144–162°F)	Brabender Amylograph / DSC
Gelatinization Peak	67–70°C	DSC
Paste Clarity	60–75% transmittance at 650 nm	Colorimetric
Ash Alkalinity	≤1.0 meq/kg	Titration

Viscosity Grades — Selection Guide

Organic Cornstarch is available in three viscosity grades, determined by processing conditions that affect granule size distribution and molecular weight:

Viscosity Grade	Typical Brabender Peak Viscosity	Particle Size	Best For
High Viscosity (Standard)	600–700 BU	Fine (90–98% through 100 mesh)	Pie fillings, puddings, thickening sauces
Medium Viscosity	350–500 BU	Medium (85% through 100 mesh)	Soup thickeners, batter coatings
Low Viscosity / Cold-Swelling	150–250 BU	Fine	Spray-dried applications, instant mixes, glazes

Note: Viscosity grades are achieved through mechanical classification during milling — not through chemical modification. Confirm the required grade with your production team before ordering.

Amylose/Amylopectin Ratio & Functional Impact

Property	Effect of Higher Amylose (25–27%)	Effect of Higher Amylopectin

Gel Strength	Stronger, more rigid gel	Softer, more cohesive gel
Paste Clarity	Higher clarity	Lower clarity, more turbid
Freeze-Thaw Stability	Moderate (2–3 cycles)	Poor (1–2 cycles)
Film Formation	Superior	Limited
Retrogradation	Higher (staling risk)	Lower
Shear Resistance	Moderate	Lower

Organic Cornstarch vs Modified Starches vs Conventional Cornstarch

Parameter	**Organic Native Cornstarch**	**Conventional Modified Cornstarch**	**Organic Modified Starch**
Processing	Mechanical wet milling only	May include acid modification, enzyme treatment, or chemical cross-linking	Organic-compliant chemical modification
E-Number	None	E1404–E1452 series	Varies by modification type
Clean-Label Status	Full clean-label	Requires E-number declaration	Depends on modification agent
Gelatinization Behavior	Standard (62–72°C)	Variable (can be 55–85°C depending on modification)	Variable
Shear Stability	Low–Moderate	High	High
Freeze-Thaw Stability	Moderate	Excellent	Excellent
Label Declaration	"Corn Starch"	"Modified Corn Starch"	"Modified Corn Starch" + organic notation

MICROBIOLOGICAL & CONTAMINANT STANDARDS

Microbiological Limits

Test	**Specification**	**Method**
Total Plate Count (TPC)	≤50,000 CFU/g	ISO 4833
Yeast & Mould	≤1,000 CFU/g	ISO 21527
Coliforms	≤100 CFU/g	ISO 4831
E. coli	Negative (<3 MPN/g)	ISO 16649
Salmonella spp.	Negative / 25g	ISO 6579
Staphylococcus aureus	≤100 CFU/g	ISO 6888

Heavy Metal & Contaminant Limits

Metal / Contaminant	Specification	Method
Lead (Pb)	≤0.1 mg/kg	ICP-OES / AOAC 2015.01
Arsenic (As)	≤0.1 mg/kg	ICP-OES
Cadmium (Cd)	≤0.1 mg/kg	ICP-OES
Mercury (Hg)	≤0.05 mg/kg	ICP-OES / AAS
Aflatoxin B1	≤2 µg/kg	LC-MS/MS
Total Aflatoxins	≤4 µg/kg	LC-MS/MS
SO_2 Residual	<10 ppm	ISO 5522 / Monier-Williams

Regulatory Standards

- **FCC (Food Chemicals Codex):** Corn Starch monograph — current edition applies
- **EU 231/2012:** Specification for "starches, other" — food additive purity criteria applies
- **FDA 21 CFR 184.1444:** Corn starch — GRAS status for direct food use
- **Codex Alimentarius:** GSFA — corn starch permitted as a foodstuff (Table 3, Category B)
- **China GB/T 8883-2017:** Edible Corn Starch — national standard applies to domestic supply
- **Kosher:** Orthodox Union (OU) or equivalent — confirm availability with sales
- **Halal:** Available on request — confirm with sales team

CERTIFICATIONS

Certification	Status	Issuing Body
USDA Organic	Available	USDA-accredited certifier
Non-GMO Project Verified	Available	Non-GMO Project
Vegan	Available	Third-party vegan certifier
Gluten-Free	Available	GFCO or equivalent
Kosher	Available	OU or equivalent
Halal	Available on request	IFANCA or equivalent

COA, TDS, SDS, and Organic Transaction Certificate provided per batch. All certificates issued against the specific production batch. Non-GMO Project Verified certificate confirms zero detectable GMO content per the Non-GMO Project Standard threshold (<0.9%).

APPLICATIONS & USAGE GUIDELINES

Recommended Application Sectors

Application Sector	Sub-Application	Typical Dosage	Function	Notes
Sauces & Gravies	White sauces, béchamel, cream soups	2–5% w/w	Thickening	Add to cold liquid, then heat to gelatinize
Puddings & Pie Fillings	Instant puddings, canned pie fillings	3–8% w/w	Thickening & gel formation	Cook to 82°C for full gelatinization
Baking (Gluten-Free)	GF cakes, cookies, breads	5–15% flour replacement	Texture modifier; crumb softening	Combines well with xanthan gum (0.3–0.5%)
Confectionery & Candy	Powdered sugar anti-caking, gumdrops, pastilles	1–5%	Binding, anti-caking	Use low-viscosity grade for spray-dried applications
Coatings & Batters	Fried chicken, fish, vegetable coatings	5–12% w/w	Viscosity builder, adhesion	Provides smooth coating, crisp texture
Noodles & Pasta (GF)	GF rice/corn noodles	5–20% w/w	Binding, gel formation	Improves texture cohesion in low-protein systems
Dairy & Plant-Based Yogurt	Coconut yogurt, cashew yogurt	1–3%	Thickening, stabilization	Pre-hydrate in cold water before adding
Meat Alternatives	Plant-based burger patties, sausages	2–5%	Moisture retention, binding	Improves texture and reduces purge
Frozen Foods	Frozen sauces, pie fillings	3–6%	Thickening	Note: 2–3 freeze-thaw cycles max; use cross-linked starch for higher cycles
Soups & Bouillons	Powdered soup bases	2–8%	Thickening	Pre-gelatinized variant available for instant soups
Pharmaceuticals	Tablet binding, compressibility aid	5–25%	Excipient, diluent	USP/NF grade available — confirm with sales
Cosmetics & Personal Care	Body powder, dry shampoo, face masks	5–30%	Absorbent, soft focus	Talc-free, natural alternative
Industrial	Biodegradable packaging film, glove coatings	Variable	Film former	Corn starch films are compostable

Gelatinization Procedure

Organic Cornstarch must be fully gelatinized to develop its thickening function. Follow these steps for optimal results:

1. **Disperse** cornstarch in 3–5× its weight of cold water (≤30°C) to form a slurry
2. **Add** the slurry to the main liquid phase under agitation
3. **Heat** while stirring continuously to 82–90°C (180–195°F)
4. **Hold** at temperature for 2–5 minutes to complete gelatinization
5. **Cool** as required — gel structure forms on cooling below 65°C

> **Critical:** Never add dry cornstarch directly to boiling liquid — this causes lumping and uneven gelatinization. Always pre-disperse in cold water first.

Formulation Notes

Retrogradation (Staling): Cornstarch gels retrogradation over time — the amylose portion re-crystallizes, causing increased firmness and syneresis (water weeping). This is the primary mechanism of staling in gluten-free baked goods. Combine with hydrocolloids (hydroxypropyl methylcellulose, psyllium husk) to reduce retrogradation.

Pre-Gelatinized Variant: For instant applications (instant pudding, dry soup mixes, glazeware), pre-gelatinized cornstarch — fully gelatinized and dried prior to use — can be specified. Confirm availability with sales.

Freeze-Thaw Cycles: Native cornstarch gels are susceptible to retrogradation and syneresis after repeated freeze-thaw cycles. For frozen ready meals or frozen sauces, consider cross-linked organic modified starch or add stabilizers (e.g., 0.1–0.3% sodium carboxymethylcellulose).

Acid Stability: At pH < 4.5, native cornstarch paste viscosity decreases and paste clarity improves but gel strength is reduced. For acidic applications (fruit fillings, citrus-based sauces), use acid-modified organic starch or combine with pectin.

Shear Sensitivity: Native cornstarch paste viscosity decreases under high shear (homogenization, high-speed blending). For shear-intensive processes, chemical modification or addition of a hydrocolloid (guar gum, xanthan gum at 0.05–0.2%) provides viscosity stability.

Protein Interaction: In formulations containing high protein levels (>10% w/w, such as dairy or plant-based protein drinks), pre-hydrate the starch separately to avoid protein-starch complex formation that can reduce thickening efficiency.

FAQ

Q1: Is your organic cornstarch truly non-GMO?

A: Yes. The organic corn used to produce this starch is certified organic and non-GMO through the supply chain. Organic certification under USDA NOP and EU 2018/848 explicitly prohibits the use of genetically modified organisms at any stage of production. In addition, ORGANICWAY maintains a Non-GMO Project Verified certification, which requires testing and segregation protocols to ensure zero detectable GMO content (<0.9% threshold) from field through processing. Each batch COA documents the non-GMO status.

Q2: What is the difference between native cornstarch and modified cornstarch?

A: Native cornstarch — including this product — is produced through mechanical wet milling without any chemical, enzymatic, or physical post-treatment. Modified cornstarch has undergone additional processing (acid thinning, enzyme conversion, cross-linking, hydroxypropylation, or oxidation) to alter its functional properties.

For clean-label formulations, native cornstarch requires no E-number declaration and is labeled simply as "Corn Starch." Modified starches must be declared as "Modified Corn Starch" and carry E-numbers (e.g., E1404, E1412, E1450). If you require functional properties that native cornstarch cannot deliver — such as high shear stability, extreme freeze-thaw resistance, or low-temperature gelatinization — an organically certified modified starch may be the appropriate solution. Contact sales to discuss organic modified starch options.

Q3: Can organic cornstarch be used as a desiccant or anti-caking agent?

A: Yes. Due to its fine particle size, high purity, and low moisture content (≤12%), organic cornstarch is used in moisture-control applications beyond food:

Anti-caking in powdered sugar and spice blends: 2–5% inclusion prevents caking and clumping

Desiccant in food packaging: Absorbs ambient moisture in dried food packages

Medical glove coatings: FDA 21 CFR 177.2600 applies — confirms suitability for glove dusting

Cosmetic body powders: Talc-free, hypoallergenic alternative; certified vegan and skin-safe

Biodegradable packaging films: Corn starch is blended with PLA (polylactic acid) to produce compostable film

For non-food applications, confirm the required specifications (particle size, purity, microbial limits) with your sales contact.

Q4: Does organic cornstarch contain SO_2, and what are the labeling implications?

A: Our organic cornstarch has a residual SO_2 level of <10 ppm, confirmed per batch on the COA. This is significantly below the EU "no sulphites declared" threshold of 10 mg/kg (10 ppm) under EU Regulation 1169/2011 — meaning this product can carry "No Sulphites Added" or "Sulphite Free" labeling in EU markets.
Conventionally processed corn starch uses SO_2 in the steeping process as a softening agent. Organic mechanical wet milling achieves similar softening through extended water-steeping and physical fractionation without chemical assistance. The <10 ppm SO_2 residual in our organic product reflects this cleaner processing method.

Q5: Is organic cornstarch safe for consumers with celiac disease or gluten sensitivity?

A: Yes. Corn (maize) is naturally gluten-free — it does not contain the gluten proteins (gliadins, secalins, hordeins) found in wheat, barley, or rye. The mechanical wet milling process physically separates the starch granule from the protein-rich germ and fiber fractions of the corn kernel, resulting in ≤0.5% crude protein content in the final starch product. This is far below any threshold for gluten cross-reactivity.
Organic Cornstarch Powder is certified Gluten-Free by GFCO (Gluten-Free Certifying Organization) or equivalent. For celiac-safe labeling claims, confirm that your supply chain, manufacturing environment, and finished product also meet the relevant gluten-free standard (FDA 21 CFR Part 101.91 for US; EC 41/2009 for EU).

Q6: What viscosity grade should I choose for my application?

A: The three viscosity grades serve different processing needs:
High Viscosity (Standard): Choose this for applications where maximum thickening is required with a single starch type — classic pie fillings, white sauces, puddings, starch-based gravies. This is the most versatile grade.
Medium Viscosity: Choose for batter coatings, soup thickeners, and applications where a lighter viscosity build is desired. Useful when combining with other thickeners in complex formulations.
Low Viscosity / Cold-Swelling: Choose for spray-dried applications (instant drink mixes, powdered soups), powdered glazes, or dry-blend formulations where the starch must hydrate and thicken without cooking. Confirm cold-swelling properties with sales for the specific variant.
If you are unsure which grade suits your process, request a technical sample and viscosity curve from our lab.

Q7: What documentation is provided with each batch for regulatory compliance?

A: Each shipment includes: (1) **Certificate of Analysis (COA)** with actual batch results for starch content, moisture, pH, ash, protein, microbiological results, SO_2 residual, heavy metals, and particle size; (2) **Technical Data Sheet (TDS)** with full specifications, handling instructions, and regulatory compliance statements; (3) **Safety Data Sheet (SDS)** for transport and workplace safety; (4) **Organic Transaction Certificate (OTC)** documenting the organic chain of custody for your finished product organic certification; (5) **Non-GMO Project Verified Certificate** per batch; (6) **Halal/Kosher Certificate** if applicable to your order. COA parameters can be customized to match your internal quality specifications upon agreement.

PACKAGING & STORAGE

Packaging Options

Package Size	Packaging Material	MOQ	Notes
1 kg	Aluminum foil pouch	Trial	For lab trials and small-scale R&D
5 kg	Aluminum foil pouch	Trial	For pilot runs
20 kg	Kraft paper bag + food-grade PE liner	Standard	Primary commercial format
25 kg	Kraft paper bag + food-grade PE liner	Standard	Primary commercial format
500 kg	Big bag (FIBC)	Commercial	Bulk industrial applications
20 MT	20 ft container (bagged)	Commercial	Full container load
Custom	Bulk tanker / dedicated container	Commercial	For long-term contracted supply

All packaging materials comply with EU 10/2011 and FDA 21 CFR food-contact regulations. Packaging is not sterile — handle under standard food-grade hygiene conditions. Custom bag sizes, private labeling, and COA format customization available under contracted supply

agreements.

Storage Conditions

- **Storage temperature:** ≤25°C (cool, dry environment)
- **Relative humidity:** ≤55% RH
- **Avoid:** Moisture, humidity, strong odors, direct sunlight, rodents, insects
- **Shelf life:** 18–24 months from manufacturing date (sealed, unopened, stored as directed)
- **Post-opening:** Use within 30 days; reseal immediately; monitor moisture ingress

For more information, please visit our website:

https://www.organic-way.com/products/organic-cornstarch-powder/