

SIGMA AgriScience

TECHNICAL DATA SHEET

POWDER+

Fine powder (~20 µm) · 100% virgin pecan shell biochar

Sigma Biochar Powder+

Fine pecan shell biochar for liquids, coatings and blends

An ultra-fine biochar milled from 100% virgin pecan shells. At about 20 microns, Powder+ suspends in liquid fertilizers, coats seed and granules evenly, and brings high surface area for adsorption, nutrient buffering and microbial habitat.



Sigma Biochar Powder+: ultra-fine, high surface area.

Typical product characteristics

Particle size	**~20 microns**
Ash content	**4–5% w/w**
Moisture (as shipped)	**~9% w/w**
Surface area	**250–265 m^2/g**
Bulk density	**31.5 lb / ft^3**
pH	**9.7**

Physical and chemical properties

Parameter	Value	Method
Organic carbon	**85.0%**	ASTM D4373
Total nitrogen	**0.76%**	Dry combustion
Electrical conductivity	**0.309 dS/m**	TMECC 4.10
Liming value	**8.3% $CaCO_3$**	AOAC 955.01
Carbonates	**4.9% $CaCO_3$**	ASTM D4373
Hydrogen / carbon ratio	**0.34 mol/mol**	ASTM D4373
Volatile matter	**12.5%**	ASTM D1762-84

Key benefits

- Improves nutrient efficiency and reduces leaching
- Stays in suspension in liquid fertilizer programs
- Even coverage in seed coatings, inoculants and granule coatings
- Improves aeration, moisture retention and microbial activity
- Reduces odor and holds nutrients in compost
- Single ingredient: 100% pecan shell biochar

Application rates

Use	Starting rate
Liquid fertilizer blends	0.5 lb per gallon
Seed coatings and granulation blends	5% by weight
Soil remediation spray	0.5 lb per gallon of water, 1 gallon per 110 ft^2 (about 200 lb / acre)
Garden and soil mixes	10–20% by volume
Composting	2% by volume at start, or 20% into finished compost

Packaging: 50 lb paper bag (40 bags, 2,000 lb per pallet) · bulk tote (1,820 lb). Private label bags on request.
Storage: keep dry and covered. Can be dusty when handled dry; use a dust mask.

Typical values from representative lab samples; results vary by lot. Rates are starting points; set final rates from soil tests, blend trials and site needs. Always read and follow the product label; confirm state registration.

Heavy metals and trace elements

Element (mg/kg dry)	Result	IBI threshold range
Arsenic (As)	**ND**	13–100
Cadmium (Cd)	**ND**	1.4–39
Chromium (Cr)	**8.8**	93–1,200
Copper (Cu)	**11.8**	143–6,000
Lead (Pb)	**ND**	121–300
Mercury (Hg)	**0.09**	1–17
Nickel (Ni)	**1.3**	47–420
Selenium (Se)	**ND**	2–200
Zinc (Zn)	**8.1**	416–7,400

ND = not detected. Every result is below the International Biochar Initiative (IBI) threshold range for each element.

Why fine biochar works harder

Research on fine biochar (under 50 microns) shows stronger interaction with nutrients, microbes and soil colloids than coarser grades: faster microbial colonization, better adsorption and better suspension in liquids. That is the reason Powder+ is milled to about 20 microns.

In the bag: fertilizer blending

- **Stable carbon.** Fully carbonized, so it does not decompose in the bag. It is mildly alkaline (pH 8.5 to 9.7, with a small liming value), so bag-test new blends that carry ammonium or urea.
- **Holds nitrogen.** High surface area and porosity adsorb ammonia and ammonium, which can reduce volatilization loss and feed nitrogen back slowly. Ask the Sigma agronomy team for blend test data.
- **Handles well.** Biochar has no binder to crush, so screened grades flow through augers and conveyors without breaking down like granulated char.
- **Clean label.** One ingredient, 100% pecan shell biochar, with no added ash, manure, fillers or binders.

Sigma pecan shell biochar grades

Grade	Particle size	Best for
Powder+	~20 microns	Liquids, seed and granule coatings
EZ Mix	~1.0 mm	Dry fertilizer and soil blends
Custom screened	To your spec	Private label blends and bags

Private label and custom sizing. Every Sigma biochar grade can be private labeled. Screened chip sizes can be matched to your blend spec. The Sigma agronomy and registration teams support blend trials, label claims and state registration.

Pecan shell feedstock: a consistent, nutrient-rich, low-dust raw material that does not depend on forestry harvest. Typical values from representative lab samples; results vary by lot. Analytical methods per ASTM, EPA, AOAC and TMECC standards.