2024

PRODUCT CATALOGUE

ecobean

COFFEE WASTE REINVENTED

EcoBean - We turn coffee waste into sustainable chemicals

As pioneers in coffee waste processing, EcoBean combines advanced scientific expertise with our unwavering commitment to sustainability and environmental responsibility.

Our tech-driven company aims to tackle coffee waste and reduce the overall environmental impact of the coffee industry.

Spent coffee grounds contain valuable components such as polyphenols, hemicellulose, cellulose, lipids, and proteins. Recognizing their untapped potential, EcoBean has harnessed these resources and demonstrated that what was once considered waste can be transformed into valuable marketable products.

Through our innovative process, we convert spent coffee grounds into five usable fractions: coffee oil, antioxidants, polylactide (PLA), lignin, and protein additives.
Our strong affiliation with Warsaw University of Technology enables us to achieve the highest level of valorization of spent coffee grounds and source the most advanced chemicals available.

Our chemicals not only serve as high-quality alternatives to existing intermediates on the market, but they also boast up to 50% lower carbon footprint on average. This makes our offerings the most sustainable choice available, meeting the increasing demand for low carbon raw materials.

At EcoBean, we demonstrate that it is possible to produce top-quality products while minimizing our environmental impact. Together, let's contribute to creating a more circular world.

Coffee Oil

Antioxidants
Polylactide
Protein
Additives
Lignin

Coffee Oil

Coffee Oil imbues a unique aromatic richness and deep coffee hue. Its profile, rich in antioxidants, anti-inflammatory properties, fatty acids, caffeine, Vitamin E, and phytosterols, makes it a highly adaptable component in various industries.

Food Industry
amplifies flavor and aroma in confectionery, baked goods, and beverages.

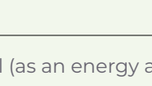
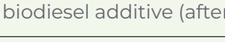
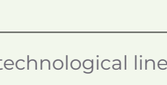
Cosmetic Industry
used in skincare products for hydration, skin tightening, and UV protection.

Petrochemical Industry
harnesses high fatty acid content as an eco-friendly biodiesel feedstock.

Pharmaceuticals
anti-inflammatory and antioxidant benefits in creams and supplements.

PRODUCT

Product Name	Coffee Oil
Processing Method	extraction > filtration > evaporation

MAIN INGREDIENTS	CHEMICAL NAME	CHEMICAL STRUCTURE	CAS-NO
	palmitic acid		57-10-3
	linoleic acid		60-33-3
	stearic acid		57-11-4
	oleic acid		112-80-1
	arachidic acid		506-30-9

PHYSICAL PARAMETERS

State of matter	thick liquid	**Odour**	woody and spicy
Colour	dark brown and caramel	**Clarity**	clear liquid
Relative density (in 25°C)	0,85 g/ml	**Flash point**	>175°C
Solubility (in 25°C)	miscible in hexane, acetone and diethyl ether immiscible in water, ethanol and acetonitrile		
Mycotoxins	none		
Technical specification	Purified grade and/or technical grade		
Packaging	50ml - 250ml dark bottle with low transparency		
Storage	in a dark and cool conditions		
Application Examples (Active Ingredients)	Petrol industry Add-on to biodiesel (as an energy additive) and Cosmetics lindustry - skin care products - soaps, peelings for face and body creams. In petrochemical industry as a biodiesel additive (after transesterification).		
Product carbon footprint	1,03 kg CO2e/kg of the product		
Freedom to operate / IP protection status	Patent application for the entire technological line to be submitted in 2023		

Coffee Oil
Antioxidants
Polylactide
Protein
Additives
Lignin

Antioxidants

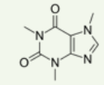
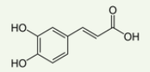
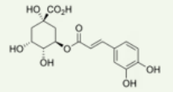
Antioxidants, key compounds in mitigating oxidative stress, offer a host of benefits. They're known for combating inflammation, shielding against UV radiation, and potentially warding off diseases like heart disease, diabetes, cancer, Alzheimer's and Parkinson's, coffee waste yields powerful antioxidants like chlorogenic acid and caffeine, underlining the broad potential of these vital compounds which find customers in various industries.

Food Industry
act as preservatives and flavor enhancers, extending shelf-life and boosting taste profiles.

Cosmetics Industry
indispensable for protecting skin from environmental damage and aging, found in various skincare and beauty products.

Packaging Industry
emerging uses in active packaging for food and beverage items to maintain freshness and improve shelf life.

PRODUCT

Product Name	Antioxidants extract		
Processing Method	extraction > filtration > RO > lyophilization		
MAIN INGREDIENTS	**CHEMICAL NAME**	**CHEMICAL STRUCTURE**	**CAS-NO**
	caffeine		58-08-2
	chlorogenic acid		327-97-9
	caffeic acid		331-39-5

PHYSICAL PARAMETERS

State of matter	ethanol solution/aqueous solution/powder
Odour	alcohol and coffee/mildly coffee
Colour	stable, strong dark brown
Clarity	clear liquid
Solubility (in 25°C)	miscible in water and ethanol
Relative density (in 25°C)	ethanol solution 0,910-0,960 g/ml , water solution 0,980-0,995 g/ml
Flash point	n/a
Mycotoxins	none
Technical specification	Extra purified grade (at least >98% of the substance)
Packaging	50ml - 250ml dark bottle with low transparency
Storage	frozen in stock/in a dark and cool conditions
Application Examples (Active Ingredients)	In cosmetic industry as creams, lotions and masks, in pharmaceutical industry as drugs and supplement ingredients
Product carbon footprint	1,17 kg CO2e/kg of the product
Freedom to operate / IP protection status	Patent application for the entire technological line to be submitted in 2023

Coffee Waste Reinvented

Coffee Oil
Antioxidants
Polylactide
Protein
Additives
Lignin

Polylactide (PLA)

PLA, an eco-friendly, biodegradable polymer, mirrors the properties of PET and PS. Formed from lactic acid polymerization, variants like Poly-L-lactide (PLLA) exhibit high tensile strength and could be successfully used in various industries. PLA from coffee waste presents an innovative, renewable source for these applications. As sustainability takes center stage, PLA's market is set for substantial growth.

Medical Industry
surgical sutures, implants.

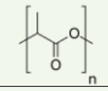
3D Printing
preferred for its biocompatibility.

Food Packaging
biodegradable containers, cutlery.

Biodegradable Fibers
manufacturing sustainable textiles.

General Manufacturing
eco-friendly plastic alternatives.

PRODUCT

Product Name	Polylactide
Chemical Name	PLA
Chemical Structure	
CAS-no	26100-51-6

PHYSICAL PARAMETERS

State of matter	granules
Odour	n/a
Colour	golden and mild brown
Granularity	1-6 mm
Packaging	in bags with a batch weight of 0,5 kg
Storage	in a dark and dry conditions
Application Examples (Active Ingredients)	packaging and textiles
Product carbon footprint	1,05 kg CO2e/kg of the product
Freedom to operate / IP protection status	• Patent application for the entire technological line to be submitted in 2023 • L, L-lactide purification method (patent no PL222655) • Method of producing polylactide for biomedical purposes with the use of biocompatible catalysts (patent no PL225851) • Method for the preparation of calcium, magnesium and zinc 2-ethylhexanoate (patent no. PL.225850)

Coffee Oil
Antioxidants
Polylactide

Protein Additives

Lignin

Protein Additives

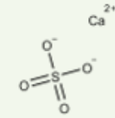
Protein additives from spent coffee grounds valorization combine gypsum, a dietary calcium source, and lactic acid bacteria biomass, rich in proteins and vitamins.

Animal Feed Industry
boosts protein and vitamin content in feed.

Food Industry
functional addition and nutrient supplement.

Agriculture
used as a soil conditioner and nutrient supplement.

PRODUCT

Product Name	Protein Additives		
Processing Method	filtration & drying (stream no1), centrifugation (stream no2)		
MAIN INGREDIENTS	**CHEMICAL NAME**	**CHEMICAL STRUCTURE**	**CAS-NO**
	calcium sulfate (stream no1)		10101-41-4 58-08-2
	bacterial biomass (stream no2)		

PHYSICAL PARAMETERS

State of matter	powder
Odour	coffee-milk
Colour	white-greyish
Granularity	highly tiny flour
Solubility (in 25°C)	n/a
Relative density (in 25°C)	n/a
Flash point	n/a
Mycotoxins	none
Technical specification	Purified grade and/or technical grade (at least 90% of the substance)
Packaging	in bags with a batch weight of 0,5 kg
Storage	in dry conditions
Application Examples (Active Ingredients)	in farming and food industry as feed additives and protein powders
Product carbon footprint	0,62 kg CO2e/kg of the product
Freedom to operate / IP protection status	Patent application for the entire technological line to be submitted in 2023

Coffee Oil Antioxidants Polylactide Protein Additives

Lignin

Lignin

Lignin, the second most abundant polymer, constitutes about 20-25% of dry coffee waste. This branched polymer is sourced sustainably from coffee waste, offering distinct advantages. With coffee waste as a sustainable lignin source, its applications across diverse markets are vast.

Bioenergy
ideal for biofuels and bioplastics production.

Chemical Industry
a renewable source of phenols and aromatics.

Agriculture
slow-release fertilizer and soil conditioner.

Material Science
carbon fibers manufacturing, adhesives, insulation.

PRODUCT

Product Name	Lignin
Chemical Name	polymers made by cross-linking phenolic precursors
CAS-no	9005-53-2 (lignin dealkaline)
Processing Method	hydrolysis + leaching

PHYSICAL PARAMETERS

State of matter	powder
Odour	woody and chocolate-citrus
Colour	chocolate colour, rich and deep
Granularity	tiny flour
Solubility (in 25°C)	insoluble
Packaging	in bags with a batch weight of 0,5 kg
Storage	in dry storage
Application Examples (Active Ingredients)	In HoReCa industry as utensils, in 3d printing as a filament and other materials industry as fibers and fillers in composites
Product carbon footprint	0,72 kg CO2e/kg of the product
Freedom to operate / IP protection status	Patent application for the entire technological line to be submitted in 2023

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Product samples for testing available upon request. Commercially available in 2025.

*The data provided on product quality is based on internal studies. The data on environmental footprint is provided under the assumption of the EcoBean Technology Centre already in operation and confirmed by Bureau Veritas.