

Revision Date: 07.01.2026 | Version: 1.0

## 1. Identification of the Substance/Mixture and of the Company/Undertaking

### 1.1 Product Identifier

Product Name: Long Pepper Supercritical CO<sub>2</sub> Extract

Product Code: AF-PRLG1TSF

CAS Number: 84929-41-9

EC Number: 284-524-7

INCI Name: Piper Longum Fruit Extract

Synonyms: Long Pepper CO<sub>2</sub> Extract, Indian Long Pepper Extract, Pippali Extract, Piperine-Rich Extract

### 1.2 Relevant Identified Uses and Uses Advised Against

Recommended Use: Dietary supplement component, nutraceutical formulations, food flavoring ingredient, cosmetic ingredient, pharmaceutical applications.

Uses Advised Against: Not intended for direct consumption without proper formulation. Industrial/professional use only.

### 1.3 Supplier Details

AltraFlora Natural Botanicals Inc.

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### 1.4 Emergency Telephone: +90 538 051 7405 (24/7)

## 2. Hazards Identification

### 2.1 Classification of the Substance or Mixture

Classification according to Regulation (EC) No 1272/2008 (CLP) and OSHA HCS (29 CFR § 1910.1200):

This product is not classified as hazardous according to the Globally Harmonized System (GHS).

### 2.2 Label Elements

Signal Word: Not applicable

Hazard Pictograms: Not applicable

Hazard Statements: Not applicable

Precautionary Statements: Not applicable

### 2.3 Other Hazards

PBT/vPvB Assessment: Not applicable — product does not meet criteria for PBT or vPvB.

Other Hazards: May cause mild skin or eye irritation in sensitive individuals. Piperine may cause a warming/tingling sensation on skin. Handle with care.

Classification System:

| NFPA Rating (0-4)                   | HMIS Rating (0-4)                   |
|-------------------------------------|-------------------------------------|
| Health: 1   Fire: 1   Reactivity: 0 | Health: 1   Fire: 1   Reactivity: 0 |

## 3. Composition/Information on Ingredients

### 3.1 Substance

Chemical Name: Long Pepper Extract (Supercritical CO<sub>2</sub> Extract)

Botanical Name: Piper longum L.

Plant Part: Fruits (spikes), dried

Extraction Method: Supercritical fluid extraction with natural carbon dioxide

Origin: India/Indonesia

| Component                                 | CAS No.    | EC No.    | Concentration | Classification |
|-------------------------------------------|------------|-----------|---------------|----------------|
| Long Pepper Fruit CO <sub>2</sub> Extract | 84929-41-9 | 284-524-7 | >99%          | Not classified |
| Piperine                                  | 94-62-2    | 202-348-0 | >25%          | Not classified |
| Piperlongumine                            | 20069-09-4 | —         | 1-5%          | Not classified |
| Piperolein B                              | 55038-30-7 | —         | 1-3%          | Not classified |
| Essential Oil Fraction                    | —          | —         | 5-15%         | Not classified |
| Fatty Acids/Lipids                        | —          | —         | 10-20%        | Not classified |

Note: Product also contains piperidine alkaloids, sesquiterpenes, and other pepper-characteristic compounds. No solvent residues, inorganic salts, or heavy metals.

## 4. First-Aid Measures

|                |                                                                                                                                                                                    |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Advice | Show this safety data sheet to the doctor in attendance. Piperine may cause warming sensation which is normal and temporary.                                                       |
| Inhalation     | Move to fresh air. May cause sneezing or mild respiratory irritation. If symptoms persist, seek medical attention.                                                                 |
| Skin Contact   | Wash with plenty of water and soap. May cause temporary warming/tingling sensation. If irritation develops or persists, seek medical attention.                                    |
| Eye Contact    | Rinse immediately with plenty of running water for 15-20 minutes, holding eyelids open. Piperine causes significant eye irritation. Seek medical attention if irritation persists. |
| Ingestion      | Rinse mouth immediately and drink plenty of water. Do not induce vomiting. May cause gastrointestinal discomfort in large amounts. Seek medical attention if symptoms occur.       |

Most Important Symptoms and Effects: Eye irritation, skin warming/tingling, sneezing upon inhalation of dust/aerosol.

Medical Attention: No specific antidote. Treat symptomatically. Inform physician of piperine content.

## 5. Fire-Fighting Measures

|                                |                                                                                                                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suitable Extinguishing Media   | Foam, carbon dioxide (CO <sub>2</sub> ), dry chemical powder, water spray.                                                                                                   |
| Unsuitable Extinguishing Media | Water jet (may spread fire).                                                                                                                                                 |
| Specific Hazards               | Product is combustible. Burning may produce carbon oxides (CO, CO <sub>2</sub> ) and nitrogen oxides (NO <sub>x</sub> ). Closed containers may rupture when exposed to fire. |
| Firefighter Protection         | Use self-contained breathing apparatus and full protective clothing. Cool containers exposed to fire with water spray. Avoid inhaling combustion products.                   |

## 6. Accidental Release Measures

|                           |                                                                                                                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Personal Precautions      | Avoid contact with skin, eyes, and clothing. Use personal protective equipment. Ensure adequate ventilation. Avoid generating dust or aerosols. Piperine dust may cause sneezing and eye irritation. |
| Environmental Precautions | Avoid release to the environment. Prevent entry into drains, waterways, and soil.                                                                                                                    |
| Containment and Cleanup   | Collect with absorbent material (sand, diatomite, universal absorbents, sawdust). Avoid generating dust. Transfer to suitable containers for disposal. Clean area with water.                        |

## 7. Handling and Storage

### 7.1 Precautions for Safe Handling

Avoid contact with skin and eyes — piperine causes warming sensation and eye irritation. Do not inhale dust or aerosols. Concentrated extracts should not be ingested directly. Use splash goggles, protective gloves, and lab coat. Keep away from ignition sources — no smoking. Wash hands thoroughly after handling.

### 7.2 Conditions for Safe Storage

|                     |                                                                                                                           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------|
| Storage Temperature | Store in a cool, dry place. Recommended: 15-25°C. Protect from heat and direct sunlight.                                  |
| Storage Conditions  | Store in a well-ventilated place. Keep container tightly closed. Store protected from light to preserve piperine content. |
| Container Materials | Stainless steel, glass, aluminum, food-grade plastic.                                                                     |
| Shelf Life          | Unopened containers: minimum 24 months under recommended storage conditions.                                              |

## 8. Exposure Controls/Personal Protection

### 8.1 Control Parameters

No occupational exposure limits established for this product or piperine.

### 8.2 Exposure Controls

|                        |                                                                                                                                                                                  |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Engineering Controls   | Use local exhaust ventilation to control dust and aerosols. General ventilation sufficient for liquid handling.                                                                  |
| Eye/Face Protection    | Chemical splash goggles required. Face shield recommended when handling large quantities. Piperine is a significant eye irritant.                                                |
| Hand Protection        | Protective gloves required. Gloves must comply with EU Directive 89/686/EEC and EN 374. Material: nitrile (recommended), neoprene, or PVC. Breakthrough time >480 min.           |
| Skin Protection        | Lab coat or protective clothing. Impermeable apron for bulk handling. Long sleeves recommended.                                                                                  |
| Respiratory Protection | Use dust/mist respirator (N95 or equivalent) if aerosols or dust are generated. Not required for normal liquid handling with adequate ventilation.                               |
| Hygiene Measures       | Wash hands thoroughly before breaks and at end of work. Do not touch face while handling. Do not eat, drink, or smoke while working. Launder contaminated clothing before reuse. |

## 9. Physical and Chemical Properties

|                                              |                                                  |
|----------------------------------------------|--------------------------------------------------|
| Appearance                                   | Orange-yellow oleoresin                          |
| Odor                                         | Characteristic, peppery, warm, spicy             |
| Odor Threshold                               | Not determined                                   |
| pH                                           | Not applicable (oily substance)                  |
| Melting Point                                | Not determined (complex mixture)                 |
| Boiling Point                                | Not determined                                   |
| Flash Point                                  | >100°C (closed cup)                              |
| Evaporation Rate                             | Not determined                                   |
| Flammability                                 | Combustible liquid                               |
| Explosive Limits                             | Not determined                                   |
| Vapor Pressure                               | Not determined                                   |
| Vapor Density                                | Not determined                                   |
| Relative Density (20°C)                      | 0.95-1.05 g/cm <sup>3</sup>                      |
| Water Solubility                             | Insoluble                                        |
| Solubility in Other Solvents                 | Soluble in ethanol, oils, propylene glycol       |
| Partition Coefficient (log K <sub>ow</sub> ) | Not determined                                   |
| Auto-ignition Temperature                    | Not determined                                   |
| Decomposition Temperature                    | Not determined                                   |
| Viscosity                                    | Viscous liquid to semi-solid at room temperature |
| Piperine Content                             | >25%                                             |
| Refractive Index (20°C)                      | 1.500-1.520                                      |
| Solvent Residues                             | None                                             |

## 10. Stability and Reactivity

|                                  |                                                                                                                                                                                                        |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reactivity                       | No hazardous reactions known under normal conditions of use.                                                                                                                                           |
| Chemical Stability               | Stable under recommended storage conditions. Piperine may degrade upon prolonged exposure to light, heat, or oxidizing conditions. Shelf life: 24 months in unopened container stored away from light. |
| Hazardous Reactions              | Under normal conditions, no ignition, explosion, self-heating, or visible decomposition.                                                                                                               |
| Conditions to Avoid              | Keep away from heat, direct sunlight, and oxidizing conditions. Store in dark containers or protected from light. Avoid prolonged exposure to temperatures above 30°C.                                 |
| Incompatible Materials           | Strong oxidizers, strong acids, strong bases.                                                                                                                                                          |
| Hazardous Decomposition Products | Carbon monoxide (CO), carbon dioxide (CO <sub>2</sub> ), nitrogen oxides (NO <sub>x</sub> ) upon thermal decomposition.                                                                                |

## 11. Toxicological Information

### 11.1 Information on Toxicological Effects

|                                |                                                                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Acute Oral Toxicity            | Not classified as hazardous. Piperine LD50 (rat, oral): 514 mg/kg. Long pepper extract has long history of safe dietary use. |
| Acute Dermal Toxicity          | Not classified as hazardous. May cause transient warming/tingling sensation (piperine effect).                               |
| Acute Inhalation Toxicity      | Not classified as hazardous. Dust/aerosol may cause sneezing, coughing, respiratory tract irritation.                        |
| Skin Corrosion/Irritation      | May cause mild, transient irritation with warming sensation. Not classified as irritant under GHS criteria.                  |
| Serious Eye Damage/Irritation  | Causes eye irritation. Piperine is a known eye irritant. Rinse thoroughly with water if contact occurs.                      |
| Respiratory/Skin Sensitization | No sensitizing effect known. Classification criteria not met.                                                                |
| Germ Cell Mutagenicity         | Not classified. Available studies show no mutagenic effects for piperine.                                                    |
| Carcinogenicity                | Not classified. Not listed by IARC, NTP, or OSHA. Some studies suggest protective effects.                                   |
| Reproductive Toxicity          | Not classified. Insufficient data. Traditional use suggests safety at culinary levels.                                       |
| STOT - Single Exposure         | Not classified. May cause respiratory irritation (Category 3) in sensitive individuals.                                      |
| STOT - Repeated Exposure       | Not classified.                                                                                                              |
| Aspiration Hazard              | Not classified.                                                                                                              |

Additional Toxicological Information: Long pepper (*Piper longum*) and piperine have a long history of safe use in Ayurvedic medicine and as a culinary spice. Piperine is known to enhance bioavailability of various nutrients and pharmaceuticals. When used according to specifications, the product does not have harmful effects based on our experience and available data.

## 12. Ecological Information

|                               |                                                                                                            |
|-------------------------------|------------------------------------------------------------------------------------------------------------|
| Toxicity                      | Based on available data, classification criteria not met. Limited ecotoxicity data available for piperine. |
| Persistence and Degradability | Readily biodegradable expected (natural plant extract). Piperine undergoes photodegradation.               |
| Bioaccumulative Potential     | Significant bioaccumulation not expected.                                                                  |
| Mobility in Soil              | Insoluble in water; low mobility in soil expected.                                                         |

|                                 |                                                           |
|---------------------------------|-----------------------------------------------------------|
| PBT/vPvB Assessment             | Does not meet PBT or vPvB criteria.                       |
| Endocrine Disrupting Properties | No evidence of endocrine disrupting properties.           |
| Other Adverse Effects           | Not hazardous to water. Avoid release to the environment. |

## 13. Disposal Considerations

|                        |                                                                                                                                                            |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Disposal       | Dispose of in accordance with local, regional, and national regulations. Small quantities may be disposed of with domestic waste. Do not pour into drains. |
| Contaminated Packaging | Disposal must be made according to official regulations. Empty containers may be recycled.                                                                 |
| Waste Code (EU)        | EWC: 16 03 06 — Organic wastes other than those mentioned in 16 03 05                                                                                      |

## 14. Transport Information

This product is not classified as dangerous goods for transport purposes.

|                          |                                                       |
|--------------------------|-------------------------------------------------------|
| UN Number                | Not regulated                                         |
| UN Proper Shipping Name  | Not regulated                                         |
| Transport Hazard Class   | Not regulated                                         |
| Packing Group            | Not regulated                                         |
| Environmental Hazards    | Marine Pollutant: No                                  |
| Land Transport (ADR/RID) | Not dangerous goods under these transport regulations |
| Sea Transport (IMDG)     | Not dangerous goods under these transport regulations |
| Air Transport (IATA)     | Not dangerous goods under these transport regulations |
| Inland Waterways (ADN)   | Not dangerous goods under these transport regulations |

Special Precautions: Keep container upright. Protect from excessive heat and direct sunlight during transport. Store in dark/opaque containers to protect piperine from light degradation.

## 15. Regulatory Information

### 15.1 Safety, Health and Environmental Regulations

#### EU Legislation:

- Regulation (EC) No 1907/2006 (REACH) — Exempt from registration under Annex V, entry 9
- Regulation (EC) No 1272/2008 (CLP) — Not classified as hazardous
- Regulation (EC) No 1223/2009 — Compliant for use in cosmetic products
- Regulation (EC) No 178/2002 — Compliant for use in food products (traditional spice)

#### US Legislation:

- TSCA (Toxic Substances Control Act): Listed
- FDA: Long pepper is permitted as a spice/natural flavoring
- FEMA GRAS: Piperine is GRAS (FEMA No. 2909)
- SARA 313: Not listed
- CERCLA: Not listed
- California Proposition 65: Not listed

#### National Regulatory Information:

- Water Hazard Class (Germany): Not hazardous to water

#### International Inventories:

| Inventory           | Status             |
|---------------------|--------------------|
| TSCA (USA)          | Listed             |
| DSL (Canada)        | Listed             |
| EINECS/ELINCS (EU)  | Listed (284-524-7) |
| IECSC (China)       | Listed             |
| AICS (Australia)    | Listed             |
| KECL (Korea)        | Listed             |
| PICCS (Philippines) | Listed             |

### 15.2 Chemical Safety Assessment: Not performed.

## 16. Other Information

### Product Specifications

|                       |                                                            |
|-----------------------|------------------------------------------------------------|
| Botanical Source      | Piper longum L. (Long Pepper, Indian Long Pepper, Pippali) |
| Plant Part Used       | Fruits (spikes), dried                                     |
| Extraction Method     | Supercritical CO <sub>2</sub> extraction                   |
| Country of Origin     | India/Indonesia                                            |
| Processing Location   | Turkey                                                     |
| Piperine Content      | >25%                                                       |
| Other Alkaloids       | Piperlongumine (1-5%), Piperolein B (1-3%)                 |
| Essential Oil Content | 5-15%                                                      |
| Solvent Residues      | None (CO <sub>2</sub> process)                             |
| Shelf Life            | 24 months from date of manufacture                         |
| Storage               | Store at 15-25°C, protect from light and heat              |

### Traditional Use and Applications

Long pepper (*Piper longum*) has been used for over 3,000 years in Ayurvedic medicine and traditional Asian cuisines. Known as 'Pippali' in Sanskrit, it was highly prized in ancient Greece and Rome as a premium spice before black pepper became more available. The fruit spikes contain high concentrations of piperine and related alkaloids. In Ayurvedic tradition, long pepper is classified as a 'Trikatu' (three pungents) component, used to support digestive function, respiratory health, and metabolism. Piperine is well-documented for its bioenhancement properties, increasing the bioavailability of various nutrients and active compounds including curcumin, resveratrol, and certain pharmaceuticals. The supercritical CO<sub>2</sub> extraction method produces a concentrated, solvent-free extract preserving the full spectrum of bioactive compounds.

### Revision Information

Revision Date: 07.01.2026

Revision: Initial Release

### Key Literature References and Data Sources:

- Srinivasan K. Black pepper and its pungent principle-piperine: a review of diverse physiological effects. Crit Rev Food Sci Nutr. 2007;47(8):735-48
- Shoba G, et al. Influence of piperine on the pharmacokinetics of curcumin. Planta Med. 1998;64(4):353-6
- Meghwal M, Goswami TK. Piper nigrum and piperine: an update. Phytother Res. 2013;27(8):1121-30

### Abbreviations:

CAS: Chemical Abstracts Service | EC: European Community | GHS: Globally Harmonized System | CLP: Classification, Labelling and Packaging | REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals | TSCA: Toxic Substances Control Act | PBT: Persistent, Bioaccumulative, Toxic | vPvB: very Persistent, very Bioaccumulative | NFPA: National Fire Protection Association | HMIS: Hazardous Materials Identification System | ADR: European Agreement on International Carriage of Dangerous Goods by Road | IMDG: International Maritime Dangerous Goods Code | IATA: International Air Transport Association | INCI: International Nomenclature of Cosmetic Ingredients | STOT: Specific Target Organ Toxicity | FEMA: Flavor and Extract Manufacturers Association | GRAS: Generally Recognized as Safe | NOx: Nitrogen Oxides

### Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

This product is intended for use as a food/dietary supplement/cosmetic/pharmaceutical ingredient and should be used only by trained personnel in accordance with applicable legislation.

End of Safety Data Sheet