

Revision Date: 10.01.2026 | Version: 1.0

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

1.1 Product Identifier

Product Name: Ginger Root CO₂ Extract (Terpene-Rich Select Fraction)

Product Code: AF-ZNGO1TSF

CAS Number: 84696-15-1

EC Number: 283-634-2

INCI Name: Zingiber Officinale (Ginger) Root Extract

Synonyms: Ginger CO₂ Select Extract, Ginger SFE, Ginger Supercritical Extract, Zingiber officinale Extract

1.2 Relevant Identified Uses and Uses Advised Against

Recommended Use: Fragrance ingredient, flavoring agent, cosmetic formulations, personal care products, aromatherapy, food and beverage applications, pharmaceutical preparations.

Uses Advised Against: Not intended for use in undiluted form on skin. For industrial/professional use.

1.3 Supplier Information

AltraFlora Natural Botanicals Inc.

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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):

GHS Classification:

Skin Sensitization Category 1 (H317)

Aspiration Hazard Category 1 (H304) — based on hydrocarbon content

2.2 Label Elements

Signal Word: Danger

Hazard Pictograms: GHS07 (Exclamation Mark), GHS08 (Health Hazard)

Hazard Statements:

H304: May be fatal if swallowed and enters airways.

H317: May cause an allergic skin reaction.

Precautionary Statements:

P261: Avoid breathing mist/vapours/spray.

P272: Contaminated work clothing should not be allowed out of the workplace.

P280: Wear protective gloves.

P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.

P331: Do NOT induce vomiting.

P333+P313: If skin irritation or rash occurs: Get medical advice/attention.

P405: Store locked up.

P501: Dispose of contents/container in accordance with local regulations.

2.3 Other Hazards

PBT/vPvB Assessment: Does not meet criteria for PBT or vPvB under REACH.

Physical Hazards: Combustible liquid. Flash point >93°C.

Potential Allergenicity: Contains naturally occurring sensitizing compounds including citronellol and farnesol. May cause skin sensitization in susceptible individuals.

Classification Systems:

NFPA Rating (0-4)	HMIS Rating (0-4)
Health: 2 Fire: 1 Reactivity: 0	Health: 2 Fire: 1 Reactivity: 0

3. Composition/Information on Ingredients

3.1 Substance

Chemical Name: Ginger Root Supercritical CO₂ Extract (Terpene-Rich Select Fraction)

Botanical Name: Zingiber officinale Roscoe

Plant Family: Zingiberaceae

Plant Part: Rhizomes (roots)

Extraction Method: Supercritical carbon dioxide (SC-CO₂) extraction — Select/First fraction

Origin: China

Typical Composition (Terpene-Rich Select Fraction):

Component	CAS No.	Class	Content
α-Zingiberene	495-60-3	Sesquiterpene	25-40%
Sesquisabinene (ar-Curcumene)	644-30-4	Sesquiterpene	7-15%
β-Bisabolene	495-61-4	Sesquiterpene	3-8%
(E)-β-Farnesene	18794-84-8	Sesquiterpene	3-7%
α-Curcumene	644-30-4	Sesquiterpene	2-5%
6-Gingerol	23513-14-6	Phenolic	4-10%
Germacrene B	15423-57-1	Sesquiterpene	<2%
Eucalyptol (1,8-Cineole)	470-82-6	Monoterpene	<2%
Citral (Geranial/Neral)	5392-40-5	Monoterpene	<1.5%

Note: Composition determined by GC-MS and GC-FID analysis. This is a terpene-rich select fraction (Stage 1) characterized by high sesquiterpene content and lower gingerol content compared to total extracts. Values may vary depending on source material and extraction parameters. The extract is predominantly composed of sesquiterpene hydrocarbons (>60%), which contribute to its characteristic fresh, spicy, citrus-like aroma (Mesomo et al., 2013; Salea et al., 2017).

4. First Aid Measures

General Advice	Remove from exposure. If symptoms persist, seek medical attention. Show this SDS to attending physician.
If Inhaled	Remove to fresh air. If breathing is difficult, give oxygen. If symptoms persist, seek medical attention.
If on Skin	Wash immediately with plenty of soap and water. Remove contaminated clothing and wash before reuse. If skin irritation or rash occurs, seek medical attention.
If in Eyes	Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. If irritation persists, seek medical attention.
If Swallowed	Immediately call a POISON CENTER or doctor. Do NOT induce vomiting due to aspiration hazard. Rinse mouth with water. Never give anything by mouth to an unconscious person.

Most Important Symptoms and Effects: May cause skin sensitization (allergic skin reaction). Aspiration into lungs may cause chemical pneumonitis which can be fatal. May cause mild respiratory, skin, or eye irritation.

Medical Attention: Treat symptomatically. In case of aspiration, monitor for respiratory distress.

5. Fire-Fighting Measures

Suitable Extinguishing Media	Foam, carbon dioxide (CO ₂), dry chemical powder, water spray.
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Unsuitable Extinguishing Media	Water jet (may spread fire).
Special Hazards	Combustible liquid. Flash point: >93°C (>200°F). Irritating and toxic fumes may be produced at high temperatures. Combustion produces carbon oxides and irritating fumes.
Firefighter Protection	Wear self-contained breathing apparatus and full protective clothing if fighting large fires. Cool containers exposed to fire with water spray. Do not allow run-off from firefighting to enter drains or water courses.

6. Accidental Release Measures

Personal Precautions	Avoid contact with skin, eyes, and clothing. Wear appropriate protective equipment. Ensure adequate ventilation. Remove sources of ignition.
Environmental Precautions	Prevent entry into drains, waterways, sewers, and soil. Contain and collect spillage.
Containment and Cleanup	Absorb with inert absorbent material (sand, vermiculite, earth). Collect in suitable containers for disposal. Clean area with detergent and water. Dispose according to local regulations.

Additional Information: May cause slip hazard on floors. Dispose of contaminated materials in accordance with applicable regulations.

7. Handling and Storage

7.1 Precautions for Safe Handling

Avoid contact with skin and eyes. Wear appropriate protective gloves. Do not eat, drink, or smoke while handling. Wash thoroughly after handling. Use only with adequate ventilation. Avoid breathing vapors, mist, or spray. Keep away from heat, sparks, open flames, and hot surfaces. Contaminated work clothing should not be allowed out of the workplace.

7.2 Conditions for Safe Storage

Storage Temperature	Store in a cool, dry place. Recommended: 15-25°C. Keep away from heat sources and direct sunlight.
Storage Conditions	Store in well-ventilated area. Keep container tightly closed. Store away from oxidizing agents and strong acids/bases. Protect from light. Keep air contact to minimum. Avoid uncoated metal containers.
Container Materials	Stainless steel, glass, aluminum, food-grade HDPE. Avoid uncoated copper, iron, or zinc containers.
Shelf Life	12 months when stored properly in sealed containers. Nitrogen blanketing recommended for bulk storage.

8. Exposure Controls/Personal Protection

8.1 Control Parameters

No specific occupational exposure limits established for this product. For individual components, refer to applicable regulations.

8.2 Exposure Controls

Engineering Controls	Use with adequate ventilation. Apply local exhaust ventilation where possible. Ensure eyewash stations and safety showers are accessible.
Eye/Face Protection	Safety glasses or goggles recommended. Face shield for splash hazard situations.
Hand Protection	Wear chemical-resistant gloves (nitrile, neoprene, or PVC recommended). Breakthrough time and permeation rate should be considered.
Skin Protection	Wear protective clothing. Long sleeves recommended. Full protective suit for large-scale handling.
Respiratory Protection	Not required under normal conditions with adequate ventilation. Use approved respirator if mist is generated or in poorly ventilated areas.
Hygiene Measures	Wash hands thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not eat, drink, or smoke in work areas.

9. Physical and Chemical Properties

Appearance	Pale yellow to amber-brown, clear to slightly hazy liquid
Odour	Characteristic spicy, fresh, warm ginger; peppery, citrus-lemon notes
Odour Threshold	Not determined
pH	Not applicable (non-aqueous)
Melting/Freezing Point	Not determined
Boiling Point	Not determined (complex mixture)
Flash Point	>93°C (>200°F) closed cup
Evaporation Rate	Not determined
Flammability	Combustible liquid (not classified as flammable)
Upper/Lower Flammability Limits	Not determined
Vapour Pressure	Low at ambient temperature
Vapour Density	Heavier than air
Relative Density (20°C)	0.870-0.890 g/cm ³
Solubility in Water	Insoluble
Solubility in Other Solvents	Soluble in ethanol, vegetable oils, aromatic solvents
Partition Coefficient (log K _{ow})	~6.9 (estimated)
Auto-Ignition Temperature	Not determined
Decomposition Temperature	Not determined
Viscosity	Low to medium viscosity liquid
Refractive Index (20°C)	1.488-1.494
Optical Rotation	(-25°) to (-45°)

10. Stability and Reactivity

Reactivity	Combustible liquid. No dangerous reactions known under normal conditions of use.
Chemical Stability	Stable under recommended storage conditions. May oxidize slowly on prolonged exposure to air and light.
Hazardous Reactions	No hazardous polymerization occurs under normal conditions.
Conditions to Avoid	Heat, open flames, sparks, and ignition sources. Prolonged exposure to air and light. Extremes of temperature.
Incompatible Materials	Strong oxidizing agents. Strong acids and bases. Reactive metals.
Hazardous Decomposition Products	Combustion produces carbon monoxide (CO), carbon dioxide (CO ₂), and irritating fumes.

11. Toxicological Information

11.1 Information on Toxicological Effects

Acute Oral Toxicity	LD50 (rat): >2000 mg/kg bw (ginger extract). Low acute oral toxicity. FDA GRAS status for ginger extracts (21 CFR 182.20).
Acute Dermal Toxicity	Not classified. May cause skin sensitization in susceptible individuals.
Acute Inhalation Toxicity	Not classified. Vapours or mist may cause respiratory irritation.
Skin Corrosion/Irritation	Category 2 — May cause skin irritation. Contact may cause redness and irritation.
Serious Eye Damage/Irritation	Not classified. May cause mild transient irritation.
Respiratory/Skin Sensitization	Skin Sensitization Category 1 — May cause allergic skin reaction. Contains potential sensitizers (citronellol, farnesol, citral).
Germ Cell Mutagenicity	Not classified. No mutagenic potential reported for ginger extracts (Ali et al., 2008).
Carcinogenicity	Not classified. Not listed by IARC, NTP, or OSHA. Ginger has demonstrated anticarcinogenic properties (Shukla & Singh, 2007).
Reproductive Toxicity	Not classified. No reproductive toxicity reported at normal use levels.
STOT - Single Exposure	Not classified.
STOT - Repeated Exposure	Not classified. 35-day gavage study in rats showed no adverse effects up to 2000 mg/kg/day (Rong et al., 2009).
Aspiration Hazard	Category 1 — May be fatal if swallowed and enters airways (based on hydrocarbon content).

Additional Toxicological Information: Ginger and its extracts have been extensively used in traditional medicine for centuries and are generally recognized as safe (GRAS) by the FDA. The CIR Expert Panel concluded that Zingiber officinale-derived ingredients are safe in cosmetics when formulated to be non-sensitizing (CIR, 2022). The main pharmacological actions include anti-inflammatory, antioxidant, antiemetic, and antimicrobial activities (Ali et al., 2008).

12. Ecological Information

Toxicity	No specific aquatic toxicity data available. Natural plant extract expected to have low aquatic toxicity.
Persistence and Degradability	Expected to be readily biodegradable. Natural terpene-based product.
Bioaccumulative Potential	Low bioaccumulation potential expected based on composition.
Mobility in Soil	Low mobility expected due to low water solubility.
PBT/vPvB Assessment	Does not meet criteria for PBT or vPvB under REACH.
Endocrine Disrupting Properties	No data available indicating endocrine disrupting properties.

Other Adverse Effects

Avoid release to the environment. May be harmful to aquatic organisms.

13. Disposal Considerations

Product Disposal	Dispose of in accordance with local, regional, national, and international regulations. Do not discharge into drains, waterways, or soil. Incinerate in approved facility or dispose at authorized hazardous waste facility.
Contaminated Packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Empty containers may contain residual product vapors.
Waste Code (EU)	EWC: 07 02 99 — Wastes not otherwise specified (from PFFU of plastics, synthetic rubber and man-made fibres) or appropriate code based on use.

14. Transport Information

This product may be regulated for transport. Classification may vary by package size.

UN Number	Not regulated for small quantities (<5L); may be UN3082 for larger quantities
UN Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (if applicable)
Transport Hazard Class	Class 9 (Miscellaneous) if regulated
Packing Group	III (if regulated)
Environmental Hazards	May be classified as marine pollutant depending on concentration
Road Transport (ADR/RID)	Consult regulations for package size thresholds
Sea Transport (IMDG)	Consult regulations for package size thresholds
Air Transport (IATA)	Consult regulations for package size thresholds

Special Precautions: Keep container upright. Store and transport in accordance with applicable regulations. Protect from heat and direct sunlight.

15. Regulatory Information

15.1 Safety, Health and Environmental Regulations

EU Legislation:

- Regulation (EC) No 1907/2006 (REACH) — Registered substance
- Regulation (EC) No 1272/2008 (CLP) — Classified as Skin Sens. 1, Asp. Tox. 1
- Regulation (EC) No 1223/2009 (Cosmetics Regulation) — Compliant for use in cosmetic products
- IFRA (International Fragrance Association) — Restricted; maximum use levels apply

US Legislation:

- FDA: Generally Recognized as Safe (GRAS) — 21 CFR 182.10, 182.20
- FEMA Number: 2522 (Ginger root oil)
- TSCA (Toxic Substances Control Act): Listed
- SARA 313: Not listed
- California Proposition 65: Not listed

Other Regulatory Information:

- RIFM (Research Institute for Fragrance Materials): Safety assessed
- CIR (Cosmetic Ingredient Review): Safe as used when formulated to be non-sensitizing (2022)

International Inventories:

Inventory	Status
TSCA (USA)	Listed
DSL (Canada)	Listed
EINECS/ELINCS (EU)	Listed (283-634-2)
IECSC (China)	Listed
AICS (Australia)	Listed
ENCS (Japan)	Listed
KECL (Korea)	Listed
PICCS (Philippines)	Listed

15.2 Chemical Safety Assessment: No chemical safety assessment has been carried out for this substance/mixture by the supplier.

16. Other Information

Product Specifications

Botanical Source	Zingiber officinale Roscoe (Ginger)
Plant Family	Zingiberaceae
Plant Part Used	Rhizomes (roots)
Extraction Method	Supercritical CO ₂ extraction — Select/First fraction
Country of Origin	China
Processing Location	Turkey
Extract Type	Terpene-rich select fraction (Stage 1)
Major Component	α -Zingiberene (25-40%)
Sesquiterpene Content	>60%
Gingerol Content	4-10% (lower than total extract)
Shelf Life	12 months (sealed, cool, dark storage)
Storage	Store at 15-25°C, protect from light and air

Traditional Use and Applications

Ginger (*Zingiber officinale* Roscoe) is a tropical flowering plant native to Southeast Asia, widely cultivated for its aromatic rhizomes. Ginger has been used for thousands of years in traditional Chinese, Ayurvedic, and Western medicine for treating nausea, digestive disorders, inflammation, and respiratory conditions (Ali et al., 2008). Supercritical CO₂ extraction produces a high-quality extract that preserves the volatile terpene compounds better than steam distillation. This terpene-rich select fraction (Stage 1 extract) is characterized by high α -zingiberene content (25-40%) and lower gingerol levels compared to total extracts, providing a fresher, more aromatic profile with dominant spicy-citrus notes (Mesomo et al., 2013). The main sesquiterpene components (α -zingiberene, β -bisabolene, β -sesquiphellandrene, α -farnesene) contribute to the characteristic fresh ginger aroma, while the lower gingerol content results in reduced pungency compared to oleoresins. Applications include perfumery, aromatherapy, flavoring of food and beverages, and cosmetic formulations where a fresh ginger character is desired.

Revision Information

Revision Date: 10.01.2026

Revision: 1.0 — Initial release

Key Literature References:

- Mesomo, M.C. et al. (2013). Supercritical CO₂ extracts and essential oil of ginger (*Zingiber officinale* R.): Chemical composition and antibacterial activity. *Journal of Supercritical Fluids*, 80, 44-49.
- Ali, B.H. et al. (2008). Some phytochemical, pharmacological and toxicological properties of ginger (*Zingiber officinale* Roscoe): A review of recent research. *Food and Chemical Toxicology*, 46(2), 409-420.
- Salea, R. et al. (2017). Supercritical fluid carbon dioxide extraction of *Zingiber officinale* Roscoe: Optimization of process parameters. *Chemical Engineering Transactions*, 56, 1705-1710.
- Shukla, Y. & Singh, M. (2007). Cancer preventive properties of ginger: A brief review. *Food and Chemical Toxicology*, 45(5), 683-690.
- Rong, X. et al. (2009). A 35-day gavage safety assessment of ginger in rats. *Regulatory Toxicology and Pharmacology*, 54(2), 118-123.
- CIR Expert Panel (2022). Safety Assessment of *Zingiber officinale* (Ginger)-Derived Ingredients. *International Journal of Toxicology*, 41(Suppl 1), 28S-50S.
- European Medicines Agency (2023). Assessment report on *Zingiber officinale* Roscoe, rhizoma. EMA/HMPC/749154/2022.

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 | FDA: Food and Drug Administration | GRAS: Generally Recognized as Safe | FEMA: Flavor and Extract Manufacturers Association | CIR: Cosmetic Ingredient Review | RIFM: Research Institute for Fragrance Materials | IFRA: International Fragrance Association | NFPA: National Fire Protection Association | HMIS: Hazardous Materials Identification System | STOT: Specific Target Organ Toxicity | SC-CO₂: Supercritical Carbon Dioxide

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. Users should review their operations in terms of applicable regulations and standards for relevant details. Keep out of reach of children.

End of Safety Data Sheet