



SAFETY DATA SHEET (SDS)

Prepared in accordance with the Globally Harmonized System (GHS) and Regulation (EC) No. 1907/2006 (REACH, as amended)

SECTION 1: Identification

tem	Details
Product Name	Grapefruit Oil
Alternative Names	Grapefruit Essential Oil 5X, Concentrated Grapefruit Oil, Folded Grapefruit Oil, Terpeneless Grapefruit Oil
Botanical Name	<i>Citrus paradisi</i> Macfad.
INCI Name	Citrus Paradisi Peel Oil
CAS Number	8016-20-4
EC Number	289-904-6
Plant Part	Fruit peel
Initial Extraction	Expression or cold pressing of grapefruit peel
Further Processing	Concentration by controlled removal of volatile terpene fractions
Product Type	Concentrated natural citrus oil / Natural Complex Substance
Recommended Use	Professional perfumery, flavour and fragrance compounds, cosmetics, soaps, detergents and household products
Uses Advised Against	Internal consumption as supplied, direct undiluted skin application, uncontrolled household use and use by children

A commercial SDS for Grapefruit Oil White 5-fold describes it as grapefruit extract and terpeneless grapefruit oil under CAS 90045-43-5 and EC 289-904-6.

SUPPLIER DETAILS

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SECTION 2: HAZARD IDENTIFICATION

Classification According to Regulation (EC) No. 1272/2008 – CLP



Hazard Class	Category	Hazard Statement
Flammable liquids	Category 3	H226: Flammable liquid and vapour
Aspiration hazard	Category 1	H304: May be fatal if swallowed and enters airways
Skin irritation	Category 2	H315: Causes skin irritation
Skin sensitisation	Category 1	H317: May cause an allergic skin reaction
Hazardous to the aquatic environment – chronic	Category 2	H411: Toxic to aquatic life with long-lasting effects

The above classification is consistent with a dedicated 5-fold grapefruit-oil SDS.

Signal Word

DANGER

Hazard Pictograms

- GHS02 – Flame
- GHS07 – Exclamation Mark
- GHS08 – Health Hazard
- GHS09 – Environment

Hazard Statements

- H226: Flammable liquid and vapour.
- H304: May be fatal if swallowed and enters airways.
- H315: Causes skin irritation.
- H317: May cause an allergic skin reaction.
- H411: Toxic to aquatic life with long-lasting effects.

Precautionary Statements

Prevention

- P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233: Keep container tightly closed.
- P240: Ground and bond container and receiving equipment during bulk transfer.
- P241: Use explosion-proof electrical and ventilation equipment where required.
- P242: Use non-sparking tools.
- P243: Take action to prevent static discharges.
- P261: Avoid breathing vapour, mist or spray.
- P264: Wash hands and exposed skin thoroughly after handling.



- P272: Contaminated work clothing should not be allowed out of the workplace.
- P273: Avoid release to the environment.
- P280: Wear protective gloves and eye or face protection.

Response

- P301+P310: IF SWALLOWED: Immediately call a POISON CENTRE or physician.
- P331: Do not induce vomiting.
- P302+P352: IF ON SKIN: Wash with plenty of soap and water.
- P333+P313: If skin irritation or rash occurs, obtain medical advice.
- P362+P364: Remove contaminated clothing and wash it before reuse.
- P303+P361+P353: IF ON SKIN or hair: Remove immediately all contaminated clothing. Rinse skin with water.
- P370+P378: In case of fire, use foam, carbon dioxide or dry chemical powder.
- P391: Collect spillage.

Storage and Disposal

- P403+P235: Store in a well-ventilated place. Keep cool.
- P405: Store locked up.
- P501: Dispose of contents and container in accordance with applicable regulations.

Phototoxicity Warning

Expressed grapefruit oil may contain naturally occurring furocoumarins with phototoxic potential.

The five-fold concentration process may increase the relative concentration of less-volatile constituents. The finished-product manufacturer must therefore assess the actual furocoumarin profile and applicable IFRA phototoxicity restrictions.

Other Hazards

Oxidation of limonene and other terpene constituents may increase skin-sensitising potential.

Oil-contaminated absorbent materials, cloths or filters may undergo heat accumulation and should not be left in uncontrolled piles.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Substance



Component	CAS Number	EC Number	Concentration
Grapefruit Extract / Concentrated Grapefruit Peel Oil	90045-43-5	289-904-6	Approximately 100%

Representative Naturally Occurring Constituents

Constituent	CAS Number	Indicative Status
d-Limonene	5989-27-5	Major constituent
Beta-Myrcene	123-35-3	Naturally occurring
Alpha-Pinene	80-56-8	Naturally occurring
Beta-Pinene	127-91-3	Naturally occurring
Sabinene	3387-41-5	Naturally occurring
Linalool	78-70-6	Naturally occurring
Citral	5392-40-5	May be present
Nootkatone	4674-50-4	Characteristic grapefruit constituent
Decanal	112-31-2	May be enriched by concentration
Octanal	124-13-0	May be present
Furocoumarins	Various	Batch dependent
Other natural oxygenated and terpene constituents	Various	Balance

A 5-fold grapefruit-oil SDS identifies d-limonene as the principal hazardous constituent, reported within the 50–100% range.

Processing Qualification

“Five fold” describes a concentrated citrus oil produced by removing part of the more volatile fraction. It does not mean that every individual chemical constituent is present at exactly five times its original level.

Actual composition depends on:

- Original grapefruit variety
- Peel quality
- Expression process
- Concentration method
- Fraction removed
- Furocoumarin treatment
- Production batch



SECTION 4: FIRST-AID MEASURES

Inhalation

Move the affected person to fresh air.

Keep them at rest in a position comfortable for breathing.

Obtain medical advice if coughing, dizziness, headache, nausea or respiratory discomfort persists.

Skin Contact

Remove contaminated clothing immediately.

Wash affected skin thoroughly with soap and plenty of water.

If redness, irritation, itching or rash develops, obtain medical advice.

Avoid sunlight or ultraviolet exposure to contaminated skin until the material has been thoroughly removed.

Wash contaminated clothing before reuse.

Eye Contact

Rinse cautiously with clean water for at least 15 minutes.

Remove contact lenses when present and easy to do. Continue rinsing.

Obtain medical attention if irritation, pain, redness or visual discomfort persists.

Ingestion

Immediately rinse the mouth.

Do not induce vomiting.

Contact a poison centre or physician immediately.

Keep the affected person at rest. Aspiration into the lungs during swallowing or vomiting may cause severe chemical pneumonitis.

Never give anything by mouth to an unconscious person.



Most Important Symptoms and Effects

Possible effects include:

- Skin redness, burning or irritation
- Allergic skin reaction
- Eye discomfort
- Headache, dizziness or nausea
- Gastrointestinal irritation
- Coughing and respiratory distress
- Chemical pneumonitis following aspiration
- Phototoxic skin reaction following sunlight exposure

Advice to Medical Personnel

Treat symptomatically.

Because of the aspiration hazard, vomiting or gastric lavage should not be induced unless performed by qualified medical personnel with appropriate airway protection.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

- Carbon dioxide
- Dry chemical powder
- Alcohol-resistant foam
- Fine water spray for cooling containers

Unsuitable Extinguishing Media

Do not use a direct high-pressure water jet because it may spread the burning liquid.

Specific Fire Hazards

The product is a flammable liquid.

Vapours may form explosive mixtures with air.

Vapours may travel to an ignition source and flash back.

Combustion or thermal decomposition may generate:



- Carbon monoxide
- Carbon dioxide
- Smoke
- Soot
- Irritating organic vapours
- Unidentified decomposition products

Protective Equipment for Firefighters

Wear self-contained breathing apparatus and full protective clothing.

Cool fire-exposed containers using water spray.

Prevent contaminated fire-fighting water from entering drains, soil or waterways.

Additional Fire Precautions

Oil-soaked cloths, paper, filter materials or absorbents should be stored in closed fire-resistant waste containers and disposed of promptly.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions

- Eliminate flames, sparks and ignition sources.
- Ensure adequate ventilation.
- Avoid breathing vapour or mist.
- Avoid contact with skin and eyes.
- Wear suitable gloves, protective clothing and eye protection.
- Prevent static discharge.
- Use non-sparking tools.
- Remove unnecessary personnel from the area.

Environmental Precautions

Prevent entry into:

- Drains
- Sewers
- Surface water
- Groundwater
- Soil



Notify the appropriate authority if a significant quantity enters the environment.

Containment and Cleaning

Contain and absorb the spill using inert, non-combustible material such as:

- Sand
- Vermiculite
- Diatomaceous earth
- Universal oil absorbent

Transfer absorbed material into a suitable, labelled chemical-waste container.

Ventilate the affected area.

Clean contaminated surfaces using detergent and water while preventing wash water from entering drains.

SECTION 7: HANDLING AND STORAGE

Safe Handling

- Use only in a well-ventilated area.
- Keep away from heat, sparks, flames and hot surfaces.
- Do not smoke while handling.
- Avoid breathing concentrated vapour, mist or aerosol.
- Avoid skin and eye contact.
- Wear chemical-resistant gloves and eye protection.
- Ground and bond containers during bulk transfer.
- Use non-sparking tools where appropriate.
- Prevent static electricity.
- Do not eat, drink or smoke in the work area.
- Wash hands thoroughly after handling.
- Keep containers tightly closed.
- Avoid prolonged exposure to air, heat and light.
- Do not swallow or apply undiluted to the skin.
- Avoid direct sunlight exposure after accidental skin contamination.

Storage Conditions

Store:

- In the original tightly closed container



- In a cool, dry and well-ventilated location
- Away from direct sunlight
- Away from heat and ignition sources
- Away from strong oxidising agents
- Separately from food and beverages
- Out of reach of children

Recommended Storage Temperature

Store at approximately 10–25 °C, unless the producer specifies otherwise.

For long-term storage, minimise headspace and oxygen exposure.

Storage Class

Flammable liquid storage provisions should be followed.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits

No specific occupational exposure limit has been established for the complete natural mixture.

Applicable occupational exposure limits for individual constituents must be observed where required.

Engineering Controls

Provide adequate general ventilation.

Use local exhaust ventilation where concentrated vapour, mist or aerosol may be generated.

Electrical and ventilation equipment should be suitable for flammable vapours where bulk quantities are handled.

Ensure eyewash and emergency-washing facilities are available.

Personal Protective Equipment

Protection Type	Recommendation
Eye and face protection	Tightly fitting chemical splash goggles; face shield for bulk transfer



Hand protection	Chemical-resistant nitrile gloves
Skin protection	Laboratory coat, apron or suitable protective clothing
Respiratory protection	Approved organic-vapour respirator where ventilation is inadequate
Thermal hazards	Not normally applicable during ambient handling
Hygiene measures	Wash hands and exposed skin after handling and before eating or drinking

A dedicated 5-fold grapefruit-oil SDS recommends nitrile-rubber gloves, sealed safety goggles and protective work clothing.

Environmental Exposure Controls

Prevent uncontrolled environmental discharge.

Use bunding or secondary containment for bulk storage.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Property	Representative Information
Physical state	Fluid liquid
Appearance	Clear to slightly hazy
Colour	Yellow-brown to red-brown
Odour	Strong, concentrated, fresh grapefruit peel, bitter-citrus and characteristic
Odour threshold	Not determined
Melting/freezing point	Not determined
Initial boiling point/range	Greater than approximately 35 °C; natural mixture
Flammability	Flammable liquid and vapour
Lower explosive limit	Approximately 0.7% v/v
Upper explosive limit	Approximately 6.1% v/v
Flash point	Approximately 54 °C
Auto-ignition/ignition temperature	Approximately 255 °C
Decomposition temperature	Not determined
pH	Not applicable
Kinematic viscosity at 40 °C	Less than 18 mm ² /s
Water solubility	Insoluble or only slightly miscible
Solubility in alcohol	Soluble or dispersible
Vapour pressure at 20 °C	Approximately 2.3 hPa



Relative density at 20°C	Approximately 0.875
Vapour density	Not determined
Explosive properties	Not explosive, but vapour-air mixtures may be explosive
Oxidising properties	Not classified as oxidising

A published 5-fold grapefruit-oil SDS reports a flash point of 54°C, density of 0.875 g/cm³, vapour pressure of 2.3 hPa, lower and upper explosive limits of 0.7% and 6.1%, and kinematic viscosity below 18 mm²/s at 40°C.

Batch-specific analytical results must take precedence.

SECTION 10: STABILITY AND REACTIVITY

Reactivity

No hazardous reaction is expected under normal handling and storage conditions.

Chemical Stability

Stable when stored correctly.

The product may oxidise, polymerise slowly or deteriorate when exposed to air, heat or light.

Possibility of Hazardous Reactions

Vapours may form flammable or explosive mixtures with air.

Hazardous polymerisation is not expected under recommended storage conditions.

Conditions to Avoid

- Excessive heat
- Direct sunlight
- Open flames
- Sparks
- Static discharge
- Prolonged exposure to air
- Moisture contamination
- Heat accumulation in contaminated absorbent materials

Incompatible Materials



- Strong oxidising agents
- Strong acids
- Strong alkalis
- Reactive halogen compounds

Hazardous Decomposition Products

Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, smoke, soot and irritating organic vapours.

SECTION 11: TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

- Skin contact
- Eye contact
- Inhalation
- Accidental ingestion

Acute Toxicity

The complete mixture is not classified as acutely toxic in this document based on available information.

Concentrated ingestion may nevertheless cause harmful effects.

Aspiration Hazard

May be fatal if swallowed and enters the airways.

Low-viscosity hydrocarbon and terpene constituents may enter the lungs during swallowing or vomiting and cause chemical pneumonitis.

Skin Corrosion/Irritation

Causes skin irritation.

Prolonged or repeated exposure may cause redness, dryness, burning or inflammation.

Serious Eye Damage/Irritation

Direct contact may cause eye irritation, tearing and discomfort.

Skin Sensitisation



May cause an allergic skin reaction.

Potential sensitising constituents include:

- Limonene
- Linalool
- Citral
- Oxidised terpene products

Phototoxicity

Expressed grapefruit peel oils may contain phototoxic furocoumarins.

Because this is a five-fold concentrated material, phototoxicity must be assessed from actual batch analytical data and intended finished-product use.

Respiratory Sensitisation

Not classified based on available information.

Concentrated vapours or aerosols may irritate the respiratory tract.

Germ-Cell Mutagenicity

Not classified based on available information for the complete Natural Complex Substance.

Carcinogenicity

Not classified based on available information for the complete mixture.

Reproductive Toxicity

Not classified based on available information.

Specific Target-Organ Toxicity — Single Exposure

High vapour concentrations may cause:

- Headache
- Dizziness
- Nausea
- Respiratory irritation

Specific Target-Organ Toxicity — Repeated Exposure



Not classified based on available information.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Toxic to aquatic life with long-lasting effects.

Representative aquatic data reported for grapefruit extract include:

Organism	Representative Endpoint
Fish	LC50, 4 days: approximately 5.65 mg/L
Daphnia	EC50, 48 hours: approximately 1.1 mg/L
Algae	EC50, 72 hours: approximately 8 mg/L
Algae	EC10, 72 hours: approximately 5.1 mg/L

These values are reported in a dedicated 5-fold grapefruit-oil SDS and should be treated as representative rather than batch-specific.

Persistence and Degradability

Complete biodegradation data are not available for the concentrated Natural Complex Substance.

Some terpene constituents may biodegrade, but concentrated discharge may still cause significant aquatic harm.

Bioaccumulative Potential

Hydrophobic terpene and oxygenated citrus constituents may have bioaccumulative potential.

Mobility in Soil

The product is poorly soluble in water and may adsorb to soil and organic matter.

PBT and vPvB Assessment

A complete PBT or vPvB assessment is not available for the natural mixture.

Endocrine-Disrupting Properties

No complete assessment is available.



Other Adverse Effects

Do not release concentrated material into drains, watercourses or soil.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of the material through an authorised chemical-waste contractor in accordance with applicable regulations.

- Do not discharge into drains, sewers or waterways.
- Do not dispose of with ordinary household waste.
- Avoid contamination of soil and groundwater.
- Dispose of contaminated absorbent as hazardous chemical waste.
- Empty containers may retain flammable vapours and hazardous residue.
- Do not cut, weld or burn uncleaned containers.
- Recycle clean containers only through an authorised facility.
- Store contaminated cloths and absorbents in closed fire-resistant containers before disposal.

SECTION 14: TRANSPORT INFORMATION

Transport Information	Classification
UN Number	UN 1993
UN Proper Shipping Name — ADR	Flammable Liquid, N.O.S. (d-Limonene), Environmentally Hazardous
UN Proper Shipping Name — IMDG	Flammable Liquid, N.O.S. (d-Limonene, Decanal), Marine Pollutant
UN Proper Shipping Name — IATA	Flammable Liquid, N.O.S. (d-Limonene Mixture)
Transport Hazard Class	3
Packing Group	III
Environmental Hazard	Yes
Marine Pollutant	Yes
ADR Tunnel Restriction Code	Confirm with current carrier documentation
EmS Code	F-E, S-E
Stowage Category	A

A specific 5-fold grapefruit-oil SDS classifies the product as UN1993, Flammable Liquid, N.O.S., Class 3, Packing Group III, with environmental and marine-pollutant marking.



Transport Qualification

Final transport classification must be verified using:

- Actual batch flash point
- Composition
- Package size
- Shipping mode
- Carrier requirements
- Current ADR, IMDG and IATA rules
- Applicable limited-quantity exemptions

SECTION 15: REGULATORY INFORMATION

This Safety Data Sheet has been structured with reference to:

- Regulation (EC) No. 1907/2006 — REACH
- Regulation (EC) No. 1272/2008 — CLP
- Regulation (EU) 2020/878
- United Nations Globally Harmonized System
- Regulation (EC) No. 1223/2009 on cosmetic products
- Applicable ADR, RID, IMDG and IATA transport provisions

IFRA and Phototoxicity

Expressed grapefruit oil is subject to IFRA phototoxicity considerations because of naturally occurring furocoumarins.

The five-fold material should not be assigned a finished-product use level without:

- Batch-specific furocoumarin analysis
- Review of the applicable IFRA Standard
- Selection of the correct finished-product category
- Calculation of the concentration in the finished product
- Consideration of all other phototoxic ingredients

Cosmetic Allergen Requirements

The material may naturally contain fragrance allergens including:

- Limonene
- Linalool
- Citral



These must be calculated and declared in the finished cosmetic product when applicable legal thresholds are exceeded.

Manufacturer Responsibility

The finished-product manufacturer is responsible for:

- Reviewing the current IFRA Standards
- Assessing phototoxicity
- Calculating regulated allergens
- Completing the cosmetic safety assessment
- Confirming transport classification
- Preparing compliant consumer labelling
- Confirming suitability for the intended application

SECTION 16: OTHER INFORMATION

Full Hazard Statements

- H226: Flammable liquid and vapour.
- H304: May be fatal if swallowed and enters airways.
- H315: Causes skin irritation.
- H317: May cause an allergic skin reaction.
- H411: Toxic to aquatic life with long-lasting effects.

Document Information

Item	Details
Document Type	Material Safety Data Sheet / Safety Data Sheet
Product	Grapefruit Oil — 5 Fold
Botanical Source	<i>Citrus paradisi</i> Macfad.
Primary CAS Number	90045-43-5
Alternative CAS Number	8016-20-4
Issue Date	17 July 2026
Revision Number	01
Supersedes	New document
Intended Users	Professional, commercial and industrial users

Natural Product Variability

Grapefruit Oil — 5 Fold is a concentrated Natural Complex Substance.



Its composition, colour, odour, physical properties, allergen profile, furocoumarin content and hazard classification may vary according to:

- Grapefruit variety
- Geographical origin
- Harvest period
- Peel condition
- Expression method
- Concentration process
- Degree of folding
- Furocoumarin treatment
- Storage conditions
- Production batch

Disclaimer

The information in this Safety Data Sheet is based on available technical documentation and current knowledge of concentrated grapefruit peel oil.

Batch-specific information, including:

- GC–MS composition
- Furocoumarin analysis
- Fragrance-allergen profile
- Flash point
- Relative density
- Producer classification
- Transport declaration

must take precedence over representative information.

This document provides guidance for safe handling, storage, transport and professional use. It does not constitute a warranty of suitability for a specific application.

The user is responsible for determining product suitability and complying with all applicable legal and regulatory requirements.

This product is not intended for internal consumption and must be stored securely away from children.

Authorised by:

Fozia Khot
Director