



SAFETY DATA SHEET

INTERNATIONAL FLAVORS & FRAGRANCES

Product APPLE OLIFFAC S

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Hazard statements	: H317 H410	May cause an allergic skin reaction. Very toxic to aquatic life with long lasting effects.
Precautionary statements	: Prevention: P261 P273 P280 Response: P333 + P313 P362 + P364 P391	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Avoid release to the environment. Wear protective gloves. If skin irritation or rash occurs: Get medical advice/ attention. Take off contaminated clothing and wash it before reuse. Collect spillage.

Hazardous components which must be listed on the label:

- 101-86-0 Hexyl Cinnamal
- 27939-60-2, 68039-48-5, 68039-49-6, 68737-61-1, 35145-02-9, 36635-35-5, 68084-52-6 Dimethylcyclohex-3-ene-1-carbaldehyde (isomer unspecified)

2.3 Other hazards

None reasonably foreseeable.

3. Composition/information on ingredients

3.1 Substances

Not applicable, product is a mixture.

3.2 Mixtures

Hazardous components

Chemical name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration [%]
1,3,4,6,7,8-hexahydro-	1222-05-5	Aquatic Chronic1; H410	20 - 25

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4,6,6,7,8,8-hexamethylindeno[5,6-c]pyran	214-946-9 01-2119488227-29	Aquatic Acute1; H400	
cis-2-tert-butylcyclohexyl acetate	88-41-5, 20298-69-5 243-718-1 01-2119970713-33	Aquatic Chronic2; H411	10 - 20
alpha,3,3-trimethylcyclohexylmethyl formate	25225-08-5 246-735-2 01-2119979543-25	Aquatic Chronic2; H411	10 - 20
undecan-4-olide	104-67-6 203-225-4	Aquatic Chronic3; H412	2,5 - 10
alpha-hexylcinnamaldehyde	101-86-0 639-566-4 01-2119533092-50	Aquatic Chronic2; H411 Skin Sens.1B; H317 Aquatic Acute1; H400	1 - 2,5
Dimethylcyclohex-3-ene-1-carbaldehyde (isomer unspecified)	27939-60-2, 68039-48-5, 68039-49-6, 68737-61-1, 35145-02-9, 36635-35-5, 68084-52-6 248-742-6, 268-263-6, 268-264-1, 272-113-5, 252-395-6, 253-139-6, 268-442-9	Acute Tox.4; H312 Skin Irrit.2; H315 Skin Sens.1B; H317 Aquatic Chronic2; H411	0,25 - 1

For the full text of the R-phrases mentioned in this Section, see Section 16.

Components with workplace control parameters

Components	EC-No.	Concentration [%]
diethyl phthalate	201-550-6	25 - 50

4. First aid measures

4.1 Description of first aid measures

- General advice : Take Hazard and Precautionary phrases (section 2) into account.
- If inhaled : Remove from exposure site to fresh air and keep at rest. If victim is unconscious, remove foreign bodies from the mouth. If victim has stopped breathing, give artificial respiration. Obtain medical advice.

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In case of skin contact : Remove contaminated clothes. Wash thoroughly with water (and soap). Contact physician if symptoms persist.

In case of eye contact : Flush immediately with water for at least 15 minutes. Contact physician if symptoms persist.

If swallowed : Rinse mouth with water and obtain medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : No information available.

Risks : No information available.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : No information available.

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Carbondioxide, dry chemical, foam.

Unsuitable extinguishing media : Do not use a direct waterjet on burning material.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Water may be ineffective.

5.3 Advice for firefighters

Further information : Standard procedure for chemical fires.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Avoid inhalation and contact with skin and eyes. A self-contained breathing apparatus is recommended in case of a major spill.

6.2 Environmental precautions

Environmental precautions : Keep away from drains, surface- and groundwater and soil.

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6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Clean up spillage promptly. Remove ignition sources. Provide adequate ventilation. Avoid excessive inhalation of vapours. Gross spillages should be contained by use of sand or inert powder and disposed of according to the local regulations.

6.4 Reference to other sections

Prevent spreading over a wide area (e.g. by containment or oil barriers).

7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid excessive inhalation of concentrated vapors. Follow good manufacturing practices for housekeeping and personal hygiene. Wash any exposed skin immediately after any chemical contact, before breaks and meals, and at the end of each work period. Contaminated clothing and shoes should be thoroughly cleaned before re-use.

If appropriate, procedures used during the handling of this material should also be used when cleaning equipment or removing residual chemicals from tanks or other containers, especially when steam or hot water is used, as this may increase vapor concentrations in the workplace air. Where chemicals are openly handled, access should be restricted to properly trained employees. Keep all heated processes at the lowest necessary temperature in order to minimize emissions of volatile chemicals into the air.

Advice on protection against fire and explosion : Keep away from ignition sources and naked flame.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store in a cool, dry, ventilated area away from heat sources. Keep containers upright and tightly closed when not in use.

7.3 Specific end use(s)

Specific use(s) : No information available.

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8. Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Components	EC-No.	Exposure limit(s)
diethyl phthalate	201-550-6	TWA

DNEL

1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylindeno[5,6-c]pyran : End Use: Workers
Exposure routes: Skin contact
Potential health effects: Long-term systemic effects
Exposure time: 8 h
Value: 60 mg/kg bw/day

End Use: Workers
Exposure routes: Inhalation
Potential health effects: Long-term systemic effects
Exposure time: 8 h
Value: 22 mg/m³

End Use: General population
Exposure routes: Inhalation
Potential health effects: Long-term systemic effects
Exposure time: 8 h
Value: 6,5 mg/m³

End Use: General population
Exposure routes: Skin contact

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Potential health effects: Long-term systemic effects
Exposure time: 8 h
Value: 36 mg/kg bw/day

End Use: General population
Exposure routes: Ingestion
Potential health effects: Long-term systemic effects
Exposure time: 8 h
Value: 3,8 mg/kg bw/day

PNEC

1,3,4,6,7,8-hexahydro- : Fresh water
4,6,6,7,8,8- Value: 0,0044 mg/l
hexamethylindeno[5,6-c]pyran

Marine water
Value: 0,00044 mg/l

Fresh water sediment
Value: 2 mg/kg dry weight (d.w.)

Marine sediment
Value: 0,394 mg/kg dry weight (d.w.)

Soil
Value: 0,31 mg/kg dry weight (d.w.)

8.2 Exposure controls

Engineering measures

Where appropriate, use closed systems to transfer and process this material.
If appropriate, isolate mixing rooms and other areas where this material is used or openly handled. Maintain these areas under negative air pressure relative to the rest of the plant.

Personal protective equipment

Respiratory protection : Use local exhaust ventilation around open tanks and other open sources of potential exposures in order to avoid excessive inhalation, including places where this material is openly weighed or measured. In addition, use general dilution ventilation of the work area to eliminate or reduce possible worker exposures. No respiratory protection is required during normal operations in a workplace where engineering controls such as adequate ventilation,

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etc. are sufficient.

If engineering controls and safe work practices are not sufficient, an approved, properly fitted respirator with organic vapor cartridges or canisters and particulate filters should be used:

- a) while engineering controls and appropriate safe work practices and/or procedures are being implemented; or
- b) during short term maintenance procedures when engineering controls are not in normal operation or are not sufficient; or
- c) if normal operational workplace vapor concentration in the air is increased due to heat ;
- d) during emergencies; or
- e) if engineering controls and operational practices are not sufficient to reduce airborne concentrations below an established occupational exposure limit.

Hand protection : Avoid skin contact. Use chemically resistant gloves.

Eye protection : Use tight-fitting goggles, face shield or safety glasses with side shields if eye contact might occur.

Hygiene measures : To the extent deemed appropriate, implement pre-placement and regularly scheduled ascertainment of symptoms and spirometry testing of lung function for workers who are regularly exposed to this material.
To the extent deemed appropriate, use an experienced air sampling expert to identify and measure volatile chemicals that could be present in the workplace air to determine potential exposures and to ensure the continuing effectiveness of engineering controls and operational practices to minimize exposure.

Environmental exposure controls

General advice : Keep away from drains, surface- and groundwater and soil.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : liquid
Colour : colorless to pale yellow
Odour : conforms to standard

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Odour Threshold : not determined
Flash point : 80 °C
Lower explosion limit : not determined
Upper explosion limit : not determined
Flammability (solid, gas) : not determined
Oxidizing properties : not determined
Auto-ignition temperature : not determined
pH : not determined
Melting point : not determined
Boiling point : not determined
Vapour pressure : 0,2 hPa Calculated

Density : not determined
Water solubility : not determined
Partition coefficient: n-octanol/water : not determined
Solubility in other solvents : not determined
Viscosity, dynamic : not determined
Viscosity, kinematic : not determined
Relative vapour density : not determined
Evaporation rate : not determined

9.2 Other information

Refractive index : not determined
Relative density : 0,9899 - 0,9999

10. Stability and reactivity

10.1 Reactivity

No hazards to be specially mentioned.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Note: Presents no significant reactivity hazard, by itself or in contact with water. Avoid contact with strong acids, alkali or oxidizing agents.

10.4 Conditions to avoid

Conditions to avoid : Direct sources of heat.

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10.5 Incompatible materials

Materials to avoid : Avoid contact with strong acids, alkali or oxidizing agents.

10.6 Hazardous decomposition products

Hazardous decomposition products : Carbon monoxide and unidentified organic compounds may be formed during combustion.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Skin corrosion/irritation

α -hexylcinnamaldehyde : Species: Rabbit
Result: Skin irritation
Method: Directive 67/548/EEC, Annex V, B.4.
Exposure time: 24 h
Test substance:(undiluted)

Serious eye damage/eye irritation

No lead substance

Respiratory or skin sensitisation

α -hexylcinnamaldehyde : LLNA
Species: Mouse
Result: Causes sensitisation.
Method: OECD 429

Germ cell mutagenicity

Information on ingredients with chronic toxicity hazard(s) is available upon request.

Carcinogenicity

Information on ingredients with chronic toxicity hazard(s) is available upon request.

Reproductive toxicity

Information on ingredients with chronic toxicity hazard(s) is available upon request.

Target Organ Systemic Toxicant - Single exposure

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Information on ingredients with chronic toxicity hazard(s) is available upon request.

Target Organ Systemic Toxicant - Repeated exposure

Information on ingredients with chronic toxicity hazard(s) is available upon request.

Aspiration hazard

No test data available. Ingredients with an aspiration hazard are identified in section 3.

12. Ecological information

12.1 Toxicity

Toxicity to fish

1,3,4,6,7,8-hexahydro- : LC50: 0,452 mg/l
4,6,6,7,8,8- Exposure time: 21 d
hexamethylindeno[5,6-c]pyran

Species: Lepomis macrochirus (Bluegill sunfish)
Method: OECD Test Guideline 204

Toxicity to daphnia and other aquatic invertebrates

1,3,4,6,7,8-hexahydro- : EC50: 0,9 mg/l
4,6,6,7,8,8- Exposure time: 48 h
hexamethylindeno[5,6-c]pyran Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 202

Toxicity to algae

1,3,4,6,7,8-hexahydro- : ErC50: > 0,854 mg/l
4,6,6,7,8,8- Exposure time: 72 h
hexamethylindeno[5,6-c]pyran Species: Pseudokirchneriella subcapitata (green algae)
Method: OECD Test Guideline 201

EbC50: 0,723 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity)

1,3,4,6,7,8-hexahydro- : NOEC: 0,068 mg/l
4,6,6,7,8,8- Exposure time: 36 d
hexamethylindeno[5,6-c]pyran Species: Pimephales promelas (fathead minnow)

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Method: OECD 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)
1,3,4,6,7,8-hexahydro- : NOEC: 0,111 mg/l
4,6,6,7,8,8- Exposure time: 21 d
hexamethylindeno[5,6-c]pyran Species: Daphnia magna (Water flea)
Method: OECD 211

12.2 Persistence and degradability

Biodegradability
1,3,4,6,7,8-hexahydro- : Result: Not readily biodegradable.
4,6,6,7,8,8- 2 %
hexamethylindeno[5,6-c]pyran Method: Modified Sturm Test

12.3 Bioaccumulative potential

Bioaccumulation
1,3,4,6,7,8-hexahydro- : Species: Lepomis macrochirus (Bluegill sunfish)
4,6,6,7,8,8- Exposure time: 28 d
hexamethylindeno[5,6-c]pyran Bioconcentration factor (BCF): 1.584
Method: OECD 305

12.4 Mobility in soil

Mobility : No data available

Distribution among environmental compartments
1,3,4,6,7,8-hexahydro- : Log Koc: 4,39
4,6,6,7,8,8-
hexamethylindeno[5,6-c]pyran

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Additional ecological : There is no data available for this product.

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information

13. Disposal considerations

13.1 Waste treatment methods

- Product : Dispose of according to local regulations. Avoid disposing into drainage systems and into the environment.
- Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

ADR

- UN number : 3082
- Description of the goods : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (HEXAMETHYLINDANOPYRAN)
- Labels : 9
- Packing group : III
- Environmentally hazardous : yes

IATA

- UN number : 3082
- Description of the goods : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (HEXAMETHYLINDANOPYRAN)
- Labels : 9
- Packing group : III
- Environmentally hazardous : yes

IMDG

- UN number : 3082
- Description of the goods : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (HEXAMETHYLINDANOPYRAN)
- Labels : 9
- Packing group : III
- Marine pollutant : yes (HEXAMETHYLINDANOPYRAN)

Special precautions for user : No special precautions required.

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Water contaminating class : WGK 2significantly water endangering

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15.2 Chemical safety assessment

A Chemical Safety Assessment is not required for this substance.

16. Other information

Full text of H-Statements referred to under sections 2 and 3.

H312	Harmful in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Further information

In December 2003, the National Institute for Occupational Safety and Health ("NIOSH") published an Alert on preventing lung disease in workers who use or make flavorings [NIOSH Publication Number 2004-110]. In August 2004, the United States Flavor and Extract Manufacturers Association (FEMA) issued a report entitled "Respiratory Safety in the Flavor Manufacturing Workplace".

Both of these reports provide recommendations for reducing employee exposure and for medical surveillance in the workplace. The recommendations in these reports are generally applicable to the use of any chemical in the workplace and you are strongly urged to review both of these reports.

The report published by FEMA also contains a list of "high priority" chemicals. If any of these chemicals are present in this product at a concentration $\geq 1.0\%$ due to an intentional addition by IFF, the chemical(s) will be identified in this safety data sheet.

According to Regulation (EC) No. 1907/2006 the information in this safety data sheet is based on the properties of the material known to IFF at the time the data sheet was issued. The safety data sheet is intended to provide information for a health and safety assessment of the material and the circumstances, under which it is packaged, stored or applied in the workplace. For such a safety assessment International Flavors & Fragrances holds no responsibility. This document is not intended for quality assurance purposes.

Emergency telephone number

Austria	+43 1 406 43 43
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