



Safety Data Sheet acc. to OSHA HCS

Printing date 06/06/2023

Revision date 06/06/2023

1 Identification

- **Product identifier**
- **Trade name:** Comprehensive Fatty Acid Methyl Ester Mixture 1
- **Article number:** 29334
- **Application of the substance / the mixture**
This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Cayman Chemical Co.
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108
USA
- **Information department:** Product safety department
- **Emergency telephone number:**
During normal opening times: +1 (734) 971-3335
US/CANADA: 800-424-9300
Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS02 Flame

Flammable Liquids 2

H225 Highly flammable liquid and vapor.



GHS08 Health hazard

Aspiration Hazard 1

H304 May be fatal if swallowed and enters airways.



GHS09 Environment

Aquatic Acute 1

H400 Very toxic to aquatic life.

Aquatic Chronic 1

H410 Very toxic to aquatic life with long lasting effects.

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GHS07

Skin Irritation 2

Sensitization - Skin 1

Specific Target Organ Toxicity - Single Exposure 3

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H336 May cause drowsiness or dizziness.

· **Label elements**

· **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS02



GHS07



GHS08



GHS09

· **Signal word** Danger

· **Hazard-determining components of labeling:**

Heptane

Octanoic Acid methyl ester

Stearic Acid methyl ester

· **Hazard statements**

H225 Highly flammable liquid and vapor.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H336 May cause drowsiness or dizziness.

H304 May be fatal if swallowed and enters airways.

H410 Very toxic to aquatic life with long lasting effects.

· **Precautionary statements**

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ventilating/lighting/equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P261 Avoid breathing dust/fume/gas/mist/vapors/spray

P264 Wash thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

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

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310 If swallowed: Immediately call a poison center/doctor.

P321 Specific treatment (see on this label).

P331 Do NOT induce vomiting.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312 Call a poison center/doctor if you feel unwell.

P362+P364 Take off contaminated clothing and wash it before reuse.

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

P363 Wash contaminated clothing before reuse.

P370+P378 In case of fire: Use CO₂, powder or water spray to extinguish.

P391 Collect spillage.

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P403+P233 Store in a well-ventilated place. Keep container tightly closed.
 P403+P235 Store in a well-ventilated place. Keep cool.
 P405 Store locked up.
 P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 1
 Fire = 3
 Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 1
 Fire = 3
 Reactivity = 0

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

CAS: 142-82-5 RTECS: MI7700000	Heptane	95.4%
CAS: 111-11-5 RTECS: RH0778000	Octanoic Acid methyl ester	0.14%
CAS: 111-82-0 RTECS: OF0670000	Dodecanoic acid, Methyl ester (Methyl laurate; Methyl dodecanoate}	0.14%
CAS: 112-61-8 RTECS: WI4460000	Stearic Acid methyl ester	0.14%

· **Other ingredients**

CAS: 301-00-8	α-Linolenic Acid methyl ester	0.28%
CAS: 106-70-7 RTECS: MO8401400	Hexanoic Acid methyl ester	0.14%
CAS: 110-42-9 RTECS: HD9830000	Decanoic Acid methyl ester	0.14%
CAS: 112-39-0 RTECS: ML9720000	Palmitic Acid methyl ester	0.14%
CAS: 112-62-9 RTECS: RK0895000	Oleic Acid methyl ester	0.14%
CAS: 112-63-0	Linoleic Acid methyl ester	0.14%
CAS: 124-10-7	Tetradecanoic acid, Methyl ester	0.14%
CAS: 623-42-7 RTECS: ET 5500000	methyl butyrate	0.14%

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CAS: 929-77-1	Docosanoic Acid methyl ester	0.14%
CAS: 1120-25-8	(9Z)-hexadecenoic acid, methyl ester	0.14%
CAS: 1120-28-1	Arachidic Acid methyl ester	0.14%
CAS: 1120-34-9	Methyl docosenoate (cis-13)	0.14%
CAS: 1731-86-8 RTECS: YQ2573000	Undecanoic Acid methyl ester	0.14%
CAS: 1731-88-0 RTECS: YD3950000	Tridecanoic Acid methyl ester	0.14%
CAS: 1731-92-6	Heptadecanoic Acid methyl ester	0.14%
CAS: 1937-62-8	Elaidic Acid methyl ester	0.14%
CAS: 2390-09-2	methyl cis-icos-11-enoate	0.14%
CAS: 2463-02-7	11,14-Eicosadienoic acid, methyl ester	0.14%
CAS: 2566-89-4	Arachidonic Acid methyl ester	0.14%
CAS: 2566-90-7	Docosahexaenoic Acid methyl ester	0.14%
CAS: 2733-88-2	Nervonic Acid methyl ester	0.14%
CAS: 7132-64-1	Pentadecanoic Acid methyl ester	0.14%
CAS: 16326-32-2	γ-Linolenic Acid methyl ester	0.14%
CAS: 21061-10-9	Dihomo-γ-Linolenic Acid methyl ester	0.14%
CAS: 56219-06-8	Myristoleic Acid methyl ester	0.14%
CAS: 61012-47-3	Docosadienoic Acid methyl ester	0.14%
CAS: 75190-82-8	cis-10-Heptadecenoic Acid methyl ester	0.14%
CAS: 82729-72-4	Methyl eicosatrienoate (cis-11,14,17)	0.14%
CAS: 90176-52-6	10(Z)-Pentadecenoic Acid methyl ester	0.14%

4 First-aid measures

- **Description of first aid measures**
- **General information:** Immediately remove any clothing soiled by the product.
- **After inhalation:**
Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If symptoms persist consult doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed**
No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards arising from the substance or mixture** No further relevant information available.

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- **Advice for firefighters**
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:**
Do not allow product to reach sewage system or any water course.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to section 13.
Ensure adequate ventilation.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**

- **PAC-1:**

142-82-5	Heptane	500 ppm
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- **PAC-2:**

142-82-5	Heptane	830 ppm
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- **PAC-3:**

142-82-5	Heptane	5000* ppm
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7 Handling and storage

- **Handling:**
- **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
- **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:** Store in accordance with information listed on the product insert.
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see section 7.

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- Control parameters

- Components with limit values that require monitoring at the workplace:

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.

At this time, the other constituents have no known exposure limits.

142-82-5 Heptane	
PEL	Long-term value: 2000 mg/m ³ , 500 ppm
REL	Long-term value: 350 mg/m ³ , 85 ppm Ceiling limit value: 1800* mg/m ³ , 440* ppm *15-min
TLV	Short-term value: 500 ppm Long-term value: 400 ppm
112-61-8 Stearic Acid methyl ester	
TLV	Long-term value: 10* 3** mg/m ³ A4; Fraction: *inhalable **respirable

- Additional information: The lists that were valid during the creation were used as basis.

- Exposure controls

- Personal protective equipment:

- General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Avoid contact with the skin.

Avoid contact with the eyes and skin.

- Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

- Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

- Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

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· Eye protection:



Tightly sealed goggles

9 Physical and chemical properties

· Information on basic physical and chemical properties

· General Information

· Appearance:

Form:

Liquid

Color:

Not determined.

· Odor:

Nearly odorless

· Odor threshold:

Not determined.

· Formulation

A solution in heptane

· pH-value:

Not determined.

· Change in condition

Melting point/Melting range:

-90.5 °C (-130.9 °F)

Boiling point/Boiling range:

98 °C (208.4 °F)

· Flash point:

-4 °C (24.8 °F)

· Flammability (solid, gaseous):

Highly flammable.

· Auto igniting:

215 °C (419 °F)

· Decomposition temperature:

Not determined.

· Ignition temperature:

Product is not selfigniting.

· Danger of explosion:

Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

· Explosion limits:

Lower:

1.1 Vol %

Upper:

6.7 Vol %

· Vapor pressure at 20 °C (68 °F):

48 hPa (36 mm Hg)

· Vapor pressure at 50 °C (122 °F):

190 hPa (142.5 mm Hg)

· Density at 20 °C (68 °F):

0.68 g/cm³ (5.6746 lbs/gal)

· Relative density

Not determined.

· Vapor density

Not determined.

· Evaporation rate

Not determined.

· Solubility in / Miscibility with

Water at 20 °C (68 °F):

0.05 g/l

· Partition coefficient (n-octanol/water): Not determined.

· Viscosity:

Dynamic at 20 °C (68 °F):

0.4 mPas

Kinematic:

Not determined.

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· Solvent content:	
Organic solvents:	95.4 %
VOC content:	95.40 %
	954.0 g/l / 7.96 lb/gal
· Solids content:	2.1 %
· Other information	No further relevant information available.

10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**

- **LD/LC50 values that are relevant for classification:**

142-82-5 Heptane

Inhalative	LC50/4 h	48,000 mg/m ³ (rat)
	TCLO	1,000 mg/m ³ /6m (hmn)
	LC50	103 g/m ³ /4h (rat)

111-82-0 Dodecanoic acid, Methyl ester (Methyl laurate; Methyl dodecanoate)

	Intravenous LDLO	48 mg/kg (mouse)
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112-61-8 Stearic Acid methyl ester

	Subcutaneous TDLO	5,200 mg/kg/26W intermittent (mouse)
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- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** No irritating effect.
- **Sensitization:** Sensitization possible through skin contact.
- **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant

- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer)**

None of the ingredients is listed.

- **NTP (National Toxicology Program)**

None of the ingredients is listed.

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· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Ecotoxicological effects:**
- **Remark:** Very toxic for fish
- **Additional ecological information:**
- **General notes:**
 Water hazard class 2 (Self-assessment): hazardous for water
 Do not allow product to reach ground water, water course or sewage system.
 Danger to drinking water if even small quantities leak into the ground.
 Also poisonous for fish and plankton in water bodies.
 Very toxic for aquatic organisms
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
 Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- | | |
|----------------------------------|---|
| · UN-Number | UN1993 |
| · DOT, IMDG, IATA | |
| · UN proper shipping name | Flammable liquids, n.o.s. (Heptanes) |
| · DOT | FLAMMABLE LIQUID, N.O.S. (HEPTANES, Decanoic Acid methyl ester), MARINE POLLUTANT |
| · IMDG | Flammable liquid, n.o.s. (HEPTANES) |
| · IATA | |

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· Transport hazard class(es)

· DOT



· Class

3 Flammable liquids

· Label

3

· IMDG



· Class

3 Flammable liquids

· Label

3

· IATA



· Class

3 Flammable liquids

· Label

3

· Packing group

· DOT, IMDG, IATA

II

· Environmental hazards:

Product contains environmentally hazardous substances: Heptane

· Marine pollutant:

Symbol (fish and tree)

· Special precautions for user

Warning: Flammable liquids

· Hazard identification number (Kemler code):

33

· EMS Number:

F-E, S-E

· Stowage Category

B

· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

· Transport/Additional information:

· DOT

· Quantity limitations

On passenger aircraft/rail: 5 L
On cargo aircraft only: 60 L

· IMDG

· Limited quantities (LQ)

1L

· Excepted quantities (EQ)

Code: E2

Maximum net quantity per inner packaging: 30 ml

Maximum net quantity per outer packaging: 500 ml

· IATA

· Remarks:

When sold in quantities of less than or equal to 1 mL,
or 1 g, with an Excepted Quantity Code of
E1, E2, E4, or E5, this item meets the De Minimis

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·	Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.
· UN "Model Regulation":	UN 1993 FLAMMABLE LIQUID, N.O.S. (HEPTANES), 3, II, ENVIRONMENTALLY HAZARDOUS

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.

- **Sara**

- **Section 355 (extremely hazardous substances):**

None of the ingredients is listed.

- **Section 313 (Specific toxic chemical listings):**

None of the ingredients is listed.

- **TSCA (Toxic Substances Control Act):**

142-82-5	Heptane	ACTIVE
301-00-8	α -Linolenic Acid methyl ester	ACTIVE
106-70-7	Hexanoic Acid methyl ester	ACTIVE
110-42-9	Decanoic Acid methyl ester	ACTIVE
111-11-5	Octanoic Acid methyl ester	ACTIVE
111-82-0	Dodecanoic acid, Methyl ester (Methyl laurate; Methyl dodecanoate)	ACTIVE
112-39-0	Palmitic Acid methyl ester	ACTIVE
112-61-8	Stearic Acid methyl ester	ACTIVE
112-62-9	Oleic Acid methyl ester	ACTIVE
112-63-0	Linoleic Acid methyl ester	ACTIVE
124-10-7	Tetradecanoic acid, Methyl ester	ACTIVE
623-42-7	methyl butyrate	ACTIVE
929-77-1	Docosanoic Acid methyl ester	ACTIVE
1120-28-1	Arachidic Acid methyl ester	ACTIVE
1120-34-9	Methyl docosenoate (cis-13)	ACTIVE
1731-86-8	Undecanoic Acid methyl ester	ACTIVE
1731-88-0	Tridecanoic Acid methyl ester	ACTIVE
1731-92-6	Heptadecanoic Acid methyl ester	ACTIVE
1937-62-8	Elaidic Acid methyl ester	INACTIVE
7132-64-1	Pentadecanoic Acid methyl ester	ACTIVE

- **Hazardous Air Pollutants**

None of the ingredients is listed.

- **Proposition 65**

- **Chemicals known to cause cancer:**

None of the ingredients is listed.

- **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

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· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

142-82-5 Heptane

D

· **TLV (Threshold Limit Value)**

None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

· **Department issuing SDS:** Environment protection department.

· **Contact:** -

· **Date of preparation / last revision** 06/06/2023

· **Abbreviations and acronyms:**

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

VOC: Volatile Organic Compounds (USA, EU)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

Flammable Liquids 2: Flammable liquids – Category 2

Skin Irritation 2: Skin corrosion/irritation – Category 2

Sensitization - Skin 1: Skin sensitisation – Category 1

Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) – Category 3

Aspiration Hazard 1: Aspiration hazard – Category 1

Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1

Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1