MARLOTHERM® LH Heat Transfer Fluid

PRD / SDSIN / EN / 0001

Version	Revision Date:	SDS Number:	Date of last issue: 14.03.2023
3.1	12.09.2023	150000114175	Date of first issue: 04.04.2019

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : MARLOTHERM® LH Heat Transfer Fluid

Product code : 34540-00, 50214254, P34540R0, P34540S2, P34540S1, P34540S5, E3454001, P3454002, P3454000, P34540P0, P34540P1, P34540P2

Manufacturer or supplier's details

Company : Eastman Chemical Company

Address : 200 South Wilcox Drive
Kingsport TN 37660-5147

Telephone : (423) 229-2000

Emergency telephone number : 000 800 100 7479, NCEC +65 3158 1198, International +65 6262-6462

Recommended use of the chemical and restrictions on use

Recommended use : Heat transfer fluids

Restrictions on use : None known.

2. HAZARDS IDENTIFICATION

Manufacture, Storage and Import of Hazardous Chemicals Rules 1989

Classification

GHS Classification

Skin corrosion/irritation : Category 2

Reproductive toxicity : Category 1B

Aspiration hazard : Category 1

Long-term (chronic) aquatic hazard : Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H304 May be fatal if swallowed and enters airways.

H315 Causes skin irritation.
H360FD May damage fertility. May damage the unborn child.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P203 Obtain, read and follow all safety instructions before use.
P264 Wash skin thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P301 + P316 IF SWALLOWED: Get emergency medical help immediately.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P318 IF exposed or concerned, get medical advice.
P331 Do NOT induce vomiting.
P332 + P317 If skin irritation occurs: Get medical help.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P391 Collect spillage.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards which do not result in classification

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

CAS-No. : Not Assigned

Components

Chemical name	CAS-No.	Concentration (% w/w)
benzyl toluene	27776-01-8	>= 90 - <= 100
Dibenzyl toluene	26898-17-9	< 1

Eastman is committed to the safety, health and environment of our employees, our customers, and the communities we operate within. As part of this commitment, Eastman's Safety Data Sheets (SDS) are prepared in accordance with all applicable national and local regulations. The compositions of our documents reflect these requirements which include, but are not limited to, requirements under the Globally Harmonized System of Classification and Labeling (GHS). These compositions commonly involve the use of ranges versus specific analytical values. If you require a composition that is more specific , please refer to the Certificate of Analysis, sales specification, or contact your Customer Service Representative.

4. FIRST AID MEASURES

If inhaled	:	Move to fresh air. Treat symptomatically. If symptoms persist, call a physician.
In case of skin contact	:	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before re-use. Get medical attention. Thoroughly clean shoes before reuse.
In case of eye contact	:	In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
If swallowed	:	Call a physician or poison control center immediately. Do NOT induce vomiting. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. Hold person's head low, to prevent aspiration.
Most important symptoms and effects, both acute and delayed	:	May be fatal if swallowed and enters airways. Causes skin irritation. May damage fertility. May damage the unborn child.
Notes to physician	:	Treat symptomatically.

5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Carbon dioxide (CO2) Dry chemical Water spray
Unsuitable extinguishing media	:	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards during fire-fighting	:	None known.
Hazardous combustion products	:	Hazardous decomposition products due to incomplete combustion Carbon oxides
Specific extinguishing methods	:	Use a water spray to cool fully closed containers. Do not allow run-off from fire fighting to enter drains or water courses. None known.
Special protective equipment for firefighters	:	Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Ventilate the area. Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Avoid contact with skin and eyes. Material can create slippery conditions. Wear appropriate personal protective equipment. Local authorities should be advised if significant spillages cannot be contained.
Environmental precautions	:	Avoid subsoil penetration. Do not flush into surface water or sanitary sewer system. Avoid release to the environment.
Methods and materials for containment and cleaning up	:	Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). Use mechanical handling equipment. Sweep up or vacuum up spillage and collect in suitable container for disposal. Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	None known.
Advice on safe handling	:	Avoid inhalation of vapor or mist. Avoid contact with skin, eyes and clothing. Do not taste or swallow. Ensure adequate ventilation. Wash thoroughly after handling.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Keep in a cool place away from oxidizing agents.
Packaging material	:	Suitable material: Stainless steel, Steel (all types and surface treatments)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures	:	Ensure adequate ventilation.

Personal protective equipment

Respiratory protection	:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.
Hand protection		
Remarks	:	Wear suitable gloves.
Eye protection	:	Tightly fitting safety goggles Safety glasses
Skin and body protection	:	Wear suitable protective clothing.
Protective measures	:	Remove respiratory and skin/eye protection only after vapors have been cleared from the area. Ensure that eye flushing systems and safety showers are located close to the working place. Use personal protective equipment as required.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	colourless
Odour	:	very faint
Odour Threshold	:	not determined
pH	:	not determined
Melting point/freezing point	:	-80 - -70 °C (1,013 hPa) Method: OECD Test Guideline 102
Boiling point/boiling range	:	280 - 290 °C (1,013 hPa) Method: DIN 53171
Flash point	:	137 °C Method: Pensky-Martens closed cup
Evaporation rate	:	not determined

Upper explosion limit / Upper flammability limit	:	not determined
Lower explosion limit / Lower flammability limit	:	not determined
Vapour pressure	:	< 0.01 hPa (20 °C)
Relative vapour density	:	not determined
Relative density	:	0.995 (20 °C)
Solubility(ies)		
Water solubility	:	< 0.1 mg/l (20 °C)
Partition coefficient: n-octanol/water	:	Pow: 4.3 - 4.4 (20 °C)pH: 7
Auto-ignition temperature	:	510 °C Method: DIN 51794
Decomposition temperature	:	not determined
Viscosity		
Viscosity, kinematic	:	4.0 mm2/s (20 °C)
Explosive properties	:	Not classified
Oxidizing properties	:	Not classified

10. STABILITY AND REACTIVITY

Reactivity	:	Stable at normal ambient temperature and pressure.
Chemical stability	:	No decomposition if stored normally. Stable under normal conditions.
Possibility of hazardous reactions	:	Heating can release hazardous gases. Vapours may form explosive mixture with air. Stable
Conditions to avoid	:	Direct heating, dirt, chemical contamination, sunlight, UV or ionising radiation. Extremes of temperature and direct sunlight.
Incompatible materials	:	Strong oxidizing agents
Hazardous decomposition products	:	Hydrocarbons Carbon dioxide (CO2) Carbon monoxide Benzene

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity : Remarks: No data available

Acute inhalation toxicity : Remarks: No data available

Acute dermal toxicity : Remarks: No data available

Components:

benzyl toluene:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Assessment: Based on available data, the classification criteria are not met.

Acute inhalation toxicity : LC50 (Rat): > 1.88 mg/l
Exposure time: 4 h
Method: Acute inhalation toxicity
Assessment: Based on available data, the classification criteria are not met.

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Method: Acute Dermal Toxicity
Assessment: Based on available data, the classification criteria are not met.

Dibenzyl toluene:

Acute oral toxicity : LD50 Oral (Rat): > 5,000 mg/kg
Method: OECD Test Guideline 401
Assessment: Based on available data, the classification criteria are not met.

Acute inhalation toxicity : LC0: > 0.24 mg/l
Test atmosphere: vapour
Method: OECD Test Guideline 403
Assessment: Based on available data, the classification criteria are not met.

Acute dermal toxicity : LD0 (Rabbit): > 2,000 mg/kg
Assessment: Based on available data, the classification criteria are not met.

LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Causes skin irritation.

Product:

Remarks : Causes skin irritation.

Components:

benzyl toluene:

Species : Rabbit
Method : OECD Test Guideline 404
Result : irritating
Remarks : Causes skin irritation.

Dibenzyl toluene:

Method : OECD Test Guideline 404
Result : slight irritation
Remarks : Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation

Not classified based on available information.

Product:

Remarks : No data available

Components:

benzyl toluene:

Species : Rabbit
Method : OECD Test Guideline 405
Result : slight irritation

Dibenzyl toluene:

Method : OECD Test Guideline 405
Result : No eye irritation
Remarks : Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Product:

Remarks : No data available

Components:

benzyl toluene:

Test Type	:	Buehler Test
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	non-sensitizing

Dibenzyl toluene:

Species	:	Guinea pig
Result	:	Does not cause skin sensitization.

Germ cell mutagenicity

Not classified based on available information.

Components:

benzyl toluene:

Genotoxicity in vitro	:	Result: In vitro tests did not show mutagenic effects
Genotoxicity in vivo	:	Result: In vivo tests did not show mutagenic effects

Dibenzyl toluene:

Genotoxicity in vitro	:	Remarks: In vitro tests did not show mutagenic effects
Genotoxicity in vivo	:	Remarks: In vivo tests did not show mutagenic effects

Carcinogenicity

Not classified based on available information.

Product:

Remarks	:	This information is not available.

Components:

benzyl toluene:

Remarks	:	no evidence of carcinogenic activity

Dibenzyl toluene:

Remarks	:	Based on available data, the classification criteria are not met.

Reproductive toxicity

May damage fertility. May damage the unborn child.

Product:

Effects on fertility	:	Remarks: No data available

Components:

benzyl toluene:

Effects on fertility	:	Test Type: Two-generation study

Species: Rat
Application Route: Oral
General Toxicity - Parent: NOAEL: 120 milligram per kilogram
General Toxicity F1: NOAEL: 750 milligram per kilogram
Remarks: May damage fertility. May damage the unborn child.

Dibenzyl toluene:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
General Toxicity - Parent: NOAEL: 250 mg/kg bw/day
General Toxicity F1: NOAEL: 250 mg/kg bw/day
General Toxicity F2: NOAEL: 80 mg/kg body weight
Method: OECD Test Guideline 421
Remarks: May damage fertility. May damage the unborn child.

Effects on foetal development : Test Type: Developmental Toxicity
Species: Rabbit, female
Strain: NZW
Application Route: Oral
General Toxicity Maternal: NOAEL: 75 mg/kg body weight
Developmental Toxicity: LOAEL: 10 mg/kg body weight
Method: OECD Test Guideline 414

STOT - single exposure

Not classified based on available information.

Product:

Remarks : No data available

Components:

benzyl toluene:

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

Dibenzyl toluene:

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure

Not classified based on available information.

Product:

Remarks : No data available

Components:

benzyl toluene:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Dibenzyl toluene:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

benzyl toluene:

Species	:	Rat
NOAEL	:	50 mg/kg
Application Route	:	Oral
Method	:	OECD Test Guideline 408
Target Organs	:	Liver

Aspiration toxicity

May be fatal if swallowed and enters airways.

Product:

No aspiration toxicity classification

Components:

benzyl toluene:

May be fatal if swallowed and enters airways.

Experience with human exposure

Product:

Inhalation	:	Remarks: None known.
Skin contact	:	Remarks: Causes skin irritation.
Eye contact	:	Remarks: None known.
Ingestion	:	Remarks: May be fatal if swallowed and enters airways.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

benzyl toluene:

Toxicity to fish	:	(Danio rerio (zebra fish)): Exposure time: 96 h Test Type: OECD Test Guideline 203 Remarks: Aquatic toxicity is unlikely due to low solubility.
Toxicity to daphnia and other aquatic invertebrates	:	(Daphnia magna (Water flea)): Exposure time: 48 h Test Type: static test Remarks: No toxicity at the limit of solubility

Toxicity to algae/aquatic plants	:	(Pseudokirchneriella subcapitata (microalgae)): Exposure time: 72 h Test Type: Alga, Growth Inhibition Test Remarks: No toxicity at the limit of solubility
Toxicity to microorganisms	:	EC10 (Pseudomonas putida): > 990 mg/l End point: Growth rate Exposure time: 5 h Method: OECD Test Guideline 209
Toxicity to fish (Chronic toxicity)	:	Remarks: No toxicity at the limit of solubility
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: No toxicity at the limit of solubility
Toxicity to soil dwelling organisms	:	LC50: 16.5 mg/kg Exposure time: 14 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 317
Plant toxicity	:	EC50: > 100 mg/kg End point: Growth inhibition Species: Triticum aestivm (wheat) Method: OECD Test Guideline 208
Toxicity to terrestrial organisms	:	Remarks: Not applicable

Dibenzyl toluene:

Toxicity to fish	:	(Danio rerio (zebra fish)): 0.00005 mg/l End point: mortality Exposure time: 96 h Test Type: Fish, Acute Toxicity Test
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): > 0.029 mg/l End point: Immobilization Exposure time: 48 h Test Type: Daphnia sp. Acute Immobilisation Test
Toxicity to algae/aquatic plants	:	LC50 (Skeletonema costatum (marine diatom)): 0.000016 mg/l End point: Growth rate Exposure time: 72 h Test Type: Alga, Growth Inhibition Test
Toxicity to fish (Chronic toxicity)	:	NOEC: > 0.46 mg/l End point: mortality Exposure time: 14 d Species: Leuciscus idus (Golden orfe) Test Type: Fish, Prolonged Toxicity Test: 14-day Study

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0.0014 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: Daphnia magna Reproduction Test
M-Factor (Chronic aquatic toxicity)	:	10

Persistence and degradability

Components:

benzyl toluene:

Biodegradability	:	Result: Inherently biodegradable. Testing period: 28 d Kinetic: 28 d: < 60 % Remarks: Inherently biodegradable

Bioaccumulative potential

Components:

benzyl toluene:

Bioaccumulation	:	Bioconcentration factor (BCF): 344 Method: calculated Remarks: Does not significantly accumulate in organisms.

Mobility in soil

No data available

Other adverse effects

Components:

benzyl toluene:

Additional ecological information	:	May cause long lasting harmful effects to aquatic life.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Dispose of in accordance with local regulations. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 3082

Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (benzyl toluene)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
Remarks	:	Shipping in package sizes of less than 5 L (liquids) or 5 KG (solids) may lead to a non-regulated classification.

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (benzyl toluene)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes
Remarks	:	Shipping in package sizes of less than 5 L (liquids) or 5 KG (solids) may lead to a non-regulated classification.

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. REGULATORY INFORMATION

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

The components of this product are reported in the following inventories:

TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory
AIIC	:	On the inventory, or in compliance with the inventory
DSL	:	All components of this product are on the Canadian DSL
ENCS	:	On the inventory, or in compliance with the inventory
ISHL	:	On the inventory, or in compliance with the inventory

KECI	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

Revision Date	:	12.09.2023

Further information

Other information	:	Other means of identification Dibenzylbenzene, ar-methyl derivative
Sources of key data used to compile the Safety Data Sheet	:	Chemical Safety Report
Date format	:	dd.mm.yyyy

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recom-

mendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

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 a 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.

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