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ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

Identification

1.1GHS Product identifier

Ethyl benzene, 99%

Code E 1387

2.Hazard identification

2.1Classification of the substance or mixture

Flammable liquids, Category 2

Acute toxicity - Inhalation, Category 4

Aspiration hazard, Category 1

Specific target organ toxicity \u2013 repeated exposure, Category 2

2.2GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour
H332 Harmful if inhaled
H304 May be fatal if swallowed and enters airways
H373 May cause damage to organs through prolonged or repeated exposure

Precautionary statement(s)

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.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P370+P378 In case of fire: Use ... to extinguish.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a POISON CENTER/doctor \u2013 if you feel unwell.
P301+P310 IF SWALLOWED: Immediately call a

Response

POISON CENTER/doctor/2026
P331 Do NOT induce vomiting.
P314 Get medical advice/attention if you feel unwell.
Storage P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
Disposal P501 Dispose of contents/container to ...
2.3 Other hazards which do not result in classification
none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
ethylbenzene	ethylbenzene	100-41-4	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Refer for medical attention.

In case of skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

In case of eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

If swallowed

Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

4.2 Most important symptoms/effects, acute and delayed

Inhalation may cause irritation of nose, dizziness, depression. Moderate irritation of eye with corneal injury possible. Irritates skin and may cause blisters. (USCG, 1999)

Excerpt from ERG Guide 128 [Flammable Liquids (Water-Immiscible)]: Inhalation or contact with material may irritate or burn skin and eyes. Fire may produce irritating, corrosive and/or toxic gases. Vapors may cause dizziness or suffocation. Runoff from fire control or dilution water may cause pollution. (ERG, 2016)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Immediate First Aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Aromatic hydrocarbons and related compounds/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Irritating vapors are generated when heated. Behavior in Fire: Vapor is heavier than air and may travel considerable distance to the source of ignition and flash back. (USCG, 1999)

Excerpt from ERG Guide 128 [Flammable Liquids (Water-Immiscible)]: HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Those substances designated with a (P) may polymerize explosively when heated or involved in a fire. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water. Substance may be transported hot. For hybrid vehicles, ERG Guide 147 (lithium ion batteries) or ERG Guide 138 (sodium batteries) should also be consulted. If molten aluminum is involved, refer to ERG Guide 169. (ERG, 2016)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.

Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance.

Ventilation. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

ACCIDENTAL RELEASE MEASURES: Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate

personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided. 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.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants. Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Hygroscopic. Storage class (TRGS 510): Flammable liquids.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

Recommended Exposure Limit: 10 Hour Time-Weighted Average: 100 ppm (435 mg/cu m).

Recommended Exposure Limit: 15 Minute Short-Term Exposure Limit: 125 ppm (545 mg/cu m).

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	colourless liquid
Colour	Colorless liquid
Odour	Aromatic odor
Melting point/ freezing point	-94.00°C
Boiling point or initial boiling point and boiling range	136.00°C (lit.)
Flammability	Class IB Flammable Liquid: F.I.P. below 22.78°C and BP at or above 37.78°C. Highly flammable.

Lower and upper explosion limit / flammability limit	Lower flammable limit: 0.8% by volume; Upper flammable limit: 6.7% by volume
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Flash point	15.00°C
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Auto-ignition temperature	432.22°C
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Decomposition temperature	no data available
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pH	no data available
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Kinematic viscosity	0.64 cP at 25.00°C
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Solubility	In water: 0.0206 g/100 mL
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Partition coefficient n-octanol/water (log value)	log Kow = 3.15
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Vapour pressure	28.69 psi (55.00°C)
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Density and/or relative density	0.867 g/mL at 25.00°C (lit.)
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Relative vapour density	3.7 (vs air)
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Particle characteristics no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

A very dangerous fire ... hazard when exposed to heat or flame ... The vapour mixes well with air, explosive mixtures are easily formed. ETHYLBENZENE can react vigorously with strong oxidizing materials .

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Incompatible materials: Strong oxidizing agents.

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions - Carbon oxides.

11. Toxicological information

Acute toxicity

Oral: LD50 Rat oral 5.46 g/kg.

Inhalation: no data available

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

CLASSIFICATION: D; not classifiable as to human carcinogenicity. BASIS FOR CLASSIFICATION: nonclassifiable due to lack of animal bioassays and human studies. HUMAN CARCINOGENICITY DATA: None. ANIMAL CARCINOGENICITY DATA: None. NTP has plans to initiate bioassay. Metabolism and excretion studies at 3.5, 35 and 350 mg/kg are to be conducted as well.

Reproductive toxicity

No information is available on the developmental or reproductive effects of ethylbenzene in humans. Animal studies have reported developmental effects, such as fetal resorptions, retardation of skeletal development, and an increased incidence of extra ribs in animals exposed to ethylbenzene via inhalation. (,3,5)

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

Toxicity to fish: LC50; Species: Lepomis macrochirus /bluegill/; Concentration: 32 mg/L for 96 hr /Conditions of bioassay not specified

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

After a period of inocula adaptation, ethylbenzene is biodegraded fairly rapidly by sewage or activated sludge inocula(1-3). As a component of gas oil, it is completely degraded in groundwater in 8 days(4) and seawater in 10 days(5). In a mesocosm experiment using simulated Narragansett Bay conditions, complete biodegradation occurred in approximately 2 days after a 2 week lag in spring and a 2 day lag in summer(6). Part of the attenuation in concentration from a leaky gasoline storage tank in the chalk aquifer in England has been attributed to biodegradation(7). No degradation was observed in an anaerobic reactor even after 110 days acclimation(8) or at low concentrations in a batch reactor in 11 weeks under denitrifying conditions(9). Percent removal in an anaerobic, continuous-flow, laboratory biofilm column was 7% after a 2 day detention time(10); 99% removal was observed in a similar aerobic column following a 20 min detention time(10).

12.3 Bioaccumulative potential

A BCF of 15 (log BCF of 1.19) was measured for ethylbenzene in goldfish(1). Ethylbenzene did not bioaccumulate in Coho salmon (*Oncorhynchus kisutch*) and starry flounder (*Platichthys stellatus*), BCF approximated as 1, in tests using 0.005 mg/L ethylbenzene(2). According to a classification scheme(2), these BCF values suggest the potential for bioconcentration in aquatic organisms is low. In a shellfish study, the ethylbenzene concentration in clam tissue was 5 times higher than that measured in water after an 8-day continuous-flow exposure to the water-soluble fraction of Cook Inlet crude oil(4).

12.4 Mobility in soil

Measured ethylbenzene Koc values of 224(1), 240(2) and 257(3) have been reported. According to a classification scheme(4), these Koc values suggest that ethylbenzene is expected to have moderate mobility in soil. Sorption and desorption experiments

demonstrated that the sorption process of ethylbenzene on marine sediments is reversible and that the sorption is even lower than expected from the log Kow data and the organic carbon content of the sediment(5); it was concluded that the marine sediment compartment is not an important sink for ethylbenzene(5). A soil leaching column study estimated an ethylbenzene Koc of 240 using a chromatographic methodology(6).

12.5 Other adverse effects
no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN1175 IMDG: UN1175 IATA: UN1175

14.2 UN Proper Shipping Name

ADR/RID: ETHYLBENZENE

IMDG: ETHYLBENZENE

IATA: ETHYLBENZENE

14.3 Transport hazard class(es)

ADR/RID: 6.1 IMDG: 6.1 IATA: 6.1

14.4 Packing group, if applicable

ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards

ADR/RID: no IMDG: no IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
ethylbenzene	ethylbenzene	100-41-4	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.