Isooctane 99.75% Reference Fuel Grade (PRF)

Standard	Revised	Emergency
OSHA HCS 2024 · GHS Rev. 7	2026-11-24	Chemtel 1-800-255-3924 (24/7)

1 Identification

Product Identifier	Isooctane 99.75% Reference Fuel Grade (PRF)
CAS Number	540-84-1
Chemical Formula	C8H18
Molecular Weight	114.23 g/mol
Manufacturer	Alliance Chemical 204 South Edmond Street, Taylor, TX 76574
Emergency Phone	Chemtel 1-800-255-3924 (24/7)
Synonyms	2,2,4-Trimethylpentane; iso-octane; primary reference fuel (PRF); ASTM isooctane knock test reference fuel
Recommended Use	Primary reference fuel (100 octane) for ASTM D2699 and D2700 knock-engine octane rating and PRF blends; laboratory and analytical solvent for chromatography, spectroscopy and extraction.
Restrictions on Use	For industrial, laboratory and fuel-testing use only. Not for consumer use. Highly flammable: use only with adequate ventilation, away from ignition sources. Keep out of drains and waterways (very toxic to aquatic life).

2 Hazard Identification


Flammable


Irritant / harmful


Health hazard


Environmental hazard

Classification

Flammable liquids, Category 2

Aspiration hazard, Category 1

Skin corrosion/irritation, Category 2

Specific target organ toxicity, single exposure, Category 3 (narcotic effects)

Hazardous to the aquatic environment, acute hazard, Category 1 †

Hazardous to the aquatic environment, long-term hazard, Category 1 †

† GHS environmental hazard class; not adopted under OSHA HCS (29 CFR 1910.1200).

Signal Word

Danger

Hazard Statements

- H225 Highly flammable liquid and vapor
- H304 May be fatal if swallowed and enters airways
- H315 Causes skin irritation
- H336 May cause drowsiness or dizziness
- H400 Very toxic to aquatic life
- H410 Very toxic to aquatic life with long lasting effects

Precautionary Statements

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, and lighting equipment.
P242 Use non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust, fume, gas, mist, vapors or spray.
P264 Wash hands and face thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, and eye/face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor.
P302+P352 IF ON SKIN: Wash with plenty of water and soap.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a POISON CENTER or doctor if you feel unwell.
P321 Specific treatment (see first-aid information on this label).
P331 Do NOT induce vomiting.
P332+P313 If skin irritation occurs: Get medical advice or attention.
P362 Take off contaminated clothing and wash before reuse.
P370+P378 In case of fire: Use alcohol-resistant foam, CO2 or dry chemical powder to extinguish.
P391 Collect spillage.
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 and container in accordance with local, regional, national, and international regulations.

Classification, hazard (H) and precautionary (P) statements and pictograms per OSHA HCS 2024 (29 CFR 1910.1200, Appendices A–C), aligned with GHS Rev. 7.

3 Composition / Information on Ingredients

Component	CAS No.	Formula	Concentration
2,2,4-Trimethylpentane (Isooctane)	540-84-1	C8H18	99.75-100% (v/v)

Concentrations are nominal; lot-specific values appear on the Certificate of Analysis. Components not contributing to classification are omitted.

4 First-Aid Measures

Eyes Rinse with plenty of water for at least 15 minutes. Remove contact lenses if present and easy to do. Continue rinsing. Seek medical attention immediately.

Skin Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing. Wash with soap. Get medical attention immediately.

Inhalation	Move person to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.
Ingestion	Do Not Induce Vomiting! Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention immediately.
Most Important Symptoms and Effects	Aspiration into the lungs, for example during vomiting, may cause chemical pneumonitis, which can be fatal. Skin contact causes irritation: redness, itching and pain; repeated contact may dry and crack the skin. Inhalation of vapors may cause drowsiness, dizziness, headache and nausea.
Immediate Medical Attention and Special Treatment	Aspiration hazard: if swallowed, do not induce vomiting and get medical attention immediately. Note to physician: observe for chemical pneumonitis; protect the airway before any gastric procedure.

5 Fire-Fighting Measures

Suitable Extinguishing Media	Alcohol-resistant foam, CO2, dry chemical powder. Water spray may be used to cool fire-exposed containers.
Unsuitable Extinguishing Media	Do not use a solid water stream — may scatter and spread fire.
Specific Hazards Arising from the Chemical	Vapors are heavier than air and may form explosive mixtures with air; they can travel to a source of ignition and flash back. Containers may rupture when heated.
Protective Equipment	Wear self-contained breathing apparatus and full protective clothing.
Hazardous Combustion Products	Carbon monoxide, carbon dioxide and hydrocarbons on combustion.

6 Accidental Release Measures

Personal Precautions	Use PPE as described in Section 8. Ensure adequate ventilation. Evacuate personnel to safe areas.
Hazard-Specific Precautions	Eliminate all ignition sources. Use non-sparking tools and explosion-proof equipment; ground and bond containers during cleanup.
Environmental Precautions	Prevent leakage or spillage from entering drains, sewers, or waterways.
Containment & Cleanup	Absorb with inert material. Collect in appropriate waste container. Dispose per applicable regulations.

7 Handling and Storage

Safe Handling	Use with adequate ventilation. Avoid contact with skin, eyes, and clothing. Wash thoroughly after handling. Keep container closed when not in use.
Safe Storage	Store in a cool, dry, well-ventilated area away from heat, sparks, and open flame. Keep away from incompatible materials (see Section 10). Keep containers tightly closed. Ground and bond containers when transferring material.
Specific Storage Precautions	Keep tightly closed in a cool, well-ventilated flammables area away from ignition sources and oxidizers. Ground and bond containers; open drums carefully as contents may be under pressure.

8 Exposure Controls / Personal Protection

Occupational Exposure Limits

Limit	Value
OSHA PEL	500 ppm (2,350 mg/m^3) TWA (as octane)
ACGIH TLV	300 ppm TWA (octane, all isomers)
NIOSH REL	75 ppm TWA; 385 ppm Ceiling (15 min) (as octane)
IDLH	1,000 ppm (as octane)

Engineering Controls	Use adequate ventilation. Provide eyewash stations and quick-drench showers accessible to areas of use.
Eye/Face Protection	Wear chemical safety goggles or face shield.
Skin Protection	Wear chemical-resistant gloves and protective clothing.
Respiratory Protection	Use a NIOSH-approved respirator with organic vapor cartridges. For confined spaces or exposures above the OEL, use supplied-air respiratory protection.

Exposure limits sourced from NIOSH Pocket Guide, OSHA 29 CFR 1910.1000 and ACGIH TLVs.

9 Physical & Chemical Properties

Appearance	Clear, colorless liquid
Odor	Mild, gasoline-like (petroleum) odor
Odor Threshold	No data available
pH	No data available
Melting Point / Freezing Point	-107 °C (-161 °F)
Boiling Point	99 °C (210 °F)
Flash Point	-12 °C (10 °F), closed cup (estimated)
Evaporation Rate	No data available
Flammability (solid, gas)	No data available
Upper/Lower Flammability or Explosive Limits	No data available
Vapor Pressure	49 mmHg (6.6 kPa) at 25 °C; 1.70 psi at 37.8 °C
Vapor Density	3.9 (air = 1)
Relative Density	0.69 at 15.6 °C (water = 1)
Solubility	Practically insoluble in water (about 2.4 mg/L at 25 °C)
Partition Coefficient (n-octanol/water)	log Kow 4.09
Auto-ignition Temperature	411 °C (772 °F)
Decomposition Temperature	No data available
Viscosity	0.50 cSt at 20 °C
Particle Characteristics	Not applicable
Form	Liquid
Density	0.692 g/cm^3 at 20 °C

Values shown reflect product-specific canonical data. Lot-specific ranges may vary; see the Certificate of Analysis for the shipped lot.

10 Stability and Reactivity

Reactivity	Not reactive under normal conditions of use and storage.
Chemical Stability	Stable under recommended storage conditions.
Possibility of Hazardous Reactions	None under normal processing conditions.
Conditions to Avoid	Heat, sparks, open flame, static discharge and other ignition sources. Vapors are heavier than air, form explosive mixtures with air and collect in low areas.
Incompatible Materials	Strong oxidizing agents (chlorates, nitrates, peroxides) and oxygen.
Hazardous Decomposition Products	Carbon monoxide, carbon dioxide and hydrocarbons on combustion.

11 Toxicological Information

See below for route-specific acute toxicity data.

Likely Routes of Exposure	Inhalation, skin contact, eye contact, ingestion.
Symptoms	Aspiration into the lungs, for example during vomiting, may cause chemical pneumonitis, which can be fatal. Skin contact causes irritation: redness, itching and pain; repeated contact may dry and crack the skin. Inhalation of vapors may cause drowsiness, dizziness, headache and nausea.
Delayed and Chronic Effects	Repeated skin contact may cause dermatitis (dry, cracked skin).

Route	Value
LD50 Oral	> 5,000 mg/kg (rat)

Carcinogen Classification

Agency	Status
IARC	Not listed as carcinogen.
NTP	Not listed as carcinogen.
OSHA	Not listed as carcinogen.

12 Ecological Information

Aquatic Hazard	H400 Very toxic to aquatic life H410 Very toxic to aquatic life with long lasting effects
Ecotoxicity	Classified as hazardous to the aquatic environment (see Section 2); no product-specific ecotoxicity test data on file. Avoid release to the environment.
Persistence & Degradability	Not Available
Bioaccumulative Potential	Not Available
Mobility in Soil	Not Available

13 Disposal Considerations

Dispose of contents/container in accordance with applicable federal, state, and local regulations. Do not dispose of into drains or waterways.

EPA RCRA Waste Codes	D001 (ignitable). Isooctane is not a P- or U-listed waste; spent mixtures with listed solvents may carry F-codes. The generator makes the final determination.

If discarded, this material may be an ignitable hazardous waste (EPA RCRA D001, 40 CFR 261.21(a)(1): flash point below 60 °C; aqueous solutions with less than 24% alcohol by volume are excluded). The waste generator must make the final hazardous-waste determination.

14 Transport Information

US DOT (49 CFR)

UN Number	UN1262
Proper Shipping Name	Octanes
Hazard Class	3
Packing Group	II
Environmental Hazards	Meets GHS aquatic-hazard criteria; may be a marine pollutant under the IMDG Code (vessel transport).

IMDG / IATA classifications may differ from US DOT. Verify current regulations before international shipment.

15 Regulatory Information

Inventory / List	Status
California Proposition 65	Not listed
US EPA TSCA Active Inventory	Listed
EPCRA SARA 313 (TRI)	Not listed
CERCLA Reportable Quantity (RQ)	2,2,4-Trimethylpentane is a CERCLA hazardous substance, RQ 1,000 lb (454 kg), and a Clean Air Act Section 112 hazardous air pollutant. Not an EPCRA Section 313 chemical.

SARA 311/312 hazard categories correspond to the GHS classification in Section 2. Data retrieved as of: California Proposition 65 2026-11-02; US EPA TSCA Active Inventory 2026-11-02; EPCRA SARA 313 (TRI) 2026-11-02.

16 Other Information

Revision Date	2026-11-24
Format	16-section format per OSHA HCS 2024 (29 CFR 1910.1200, Appendix D), aligned with GHS Rev. 7.

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