

# Primary Reference Fuel Pentamethylheptane (PMH)

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 05/04/2018

Revision date: 06/19/2018

Supersedes: 08/09/2017

### SECTION 1: Identification

#### 1.1. Identification

|               |  |
|---------------|--|
| Product form  | : Substance  |
| Trade name    | : Primary Reference Fuel Pentamethylheptane (PMH)  |
| Chemical name | : Isododecane  |
| CAS-No.       | : 13475-82-6   |
| Product code  | : HF3019   |
| Formula       | : C <sub>12</sub> H <sub>26</sub>  |
| Synonyms      | : 2,2,4,6,6-Pentamethylheptane / Isododecane / Hydrocarbons, C <sub>4</sub> , 1,3-butadiene-free, polymerized, triisobutylene fraction, hydrogenated |

#### 1.2. Recommended use and restrictions on use

|                              |   |
|------------------------------|---|
| Use of the substance/mixture | : Fuel for engine development and testing |
|------------------------------|---|

#### 1.3. Supplier

Haltermann Solutions™  
 15600 West Hardy Rd.  
 Houston, TX 77060 - USA  
 T 1-800-969-2542 - F 281-457-1469  
[gdunford@jhaltermann.com](mailto:gdunford@jhaltermann.com)

#### 1.4. Emergency telephone number

|                  |   |
|------------------|---|
| Emergency number | : 24 HR CHEMTREC: 1-800-424-9300; Emergency Assistance: 1-800-969-2542 (8 AM to 5 PM CDT) |
|------------------|---|

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

|                            |      |  |
|----------------------------|------|--|
| Flammable liquids          | H226 | Flammable liquid and vapour                  |
| Category 3                 |      |  |
| Aspiration hazard Category | H304 | May be fatal if swallowed and enters airways |
| 1                          |      |  |

Full text of H statements : see section 16

#### 2.2. GHS Label elements, including precautionary statements

##### GHS-US labeling

Hazard pictograms (GHS-US)



Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H226 - Flammable liquid and vapour  
 H304 - May be fatal if swallowed and enters airways

Precautionary statements (GHS-US) : P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
 P233 - Keep container tightly closed.  
 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.  
 P280 - Wear protective gloves/protective clothing/eye protection/face protection.  
 P301+P310 - If swallowed: Immediately call a doctor, a POISON CENTER  
 P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
 P331 - Do NOT induce vomiting.  
 P370+P378 - In case of fire: Use alcohol resistant foam, carbon dioxide (CO<sub>2</sub>), dry extinguishing powder to extinguish.  
 P403+P235 - Store in a well-ventilated place. Keep cool.  
 P405 - Store locked up.

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P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

### 2.3. Other hazards which do not result in classification

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substances

| Name                              | Product identifier   | %      |
|-----------------------------------|----------------------|--------|
| Isododecane<br>(Main constituent) | (CAS-No.) 13475-82-6 | > 99.5 |

Full text of hazard classes and H-statements : see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

|                                       |  |
|---------------------------------------|--|
| First-aid measures general            | : Call a physician immediately.  |
| First-aid measures after inhalation   | : Remove person to fresh air and keep comfortable for breathing.                       |
| First-aid measures after skin contact | : Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing. |
| First-aid measures after eye contact  | : Rinse eyes with water as a precaution.   |
| First-aid measures after ingestion    | : Do not induce vomiting. Call a physician immediately.                                |

### 4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after ingestion : Risk of lung edema.

### 4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.

### 5.2. Specific hazards arising from the chemical

Fire hazard : Flammable liquid and vapour.  
Reactivity : Flammable liquid and vapour.

### 5.3. Special protective equipment and precautions for fire-fighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

Emergency procedures : Ventilate spillage area. No open flames, no sparks, and no smoking.

#### 6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

### 6.2. Environmental precautions

Avoid release to the environment.

### 6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Take up liquid spill into absorbent material. Notify authorities if product enters sewers or public waters.  
Other information : Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

For further information refer to section 13.

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### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

- Precautions for safe handling : Ensure good ventilation of the work station. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Flammable vapors may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment.
- Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

#### 7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Ground/bond container and receiving equipment.
- Storage conditions : Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

No additional information available

#### 8.2. Appropriate engineering controls

- Appropriate engineering controls : Ensure good ventilation of the work station.
- Environmental exposure controls : Avoid release to the environment.

#### 8.3. Individual protection measures/Personal protective equipment

##### Hand protection:

Protective gloves

##### Eye protection:

Safety glasses

##### Skin and body protection:

Wear suitable protective clothing

##### Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory equipment

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

- Physical state : Liquid
- Appearance : Clear, colorless liquid.
- Color : Colorless
- Odor : No data available
- Odor threshold : No data available
- pH : No data available
- Melting point : Not applicable
- Freezing point : -67 °C
- Boiling point : 178 °C
- Flash point : 48 °C
- Relative evaporation rate (butyl acetate=1) : No data available
- Flammability (solid, gas) : Not applicable.
- Vapor pressure : 1.4 mm Hg at 25° C
- Relative vapor density at 20 °C : No data available
- Relative density : No data available
- Specific gravity / density : 0.75 g/cm<sup>3</sup>
- Molecular mass : 170.3 g/mol
- Solubility : No data available

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|                           |                     |
|---------------------------|---------------------|
| Log Pow                   | : 5.94              |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Viscosity, kinematic      | : No data available |
| Viscosity, dynamic        | : No data available |
| Explosion limits          | : No data available |
| Explosive properties      | : No data available |
| Oxidizing properties      | : No data available |

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Flammable liquid and vapour.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

### 10.4. Conditions to avoid

Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.

### 10.5. Incompatible materials

No additional information available

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

| Isododecane (13475-82-6)   |              |
|----------------------------|--------------|
| LD50 oral rat              | > 2000 mg/kg |
| LD50 dermal rat            | > 3160 mg/kg |
| LC50 inhalation rat (mg/l) | 1850 mg/l/4h |
| ATE US (vapors)            | 1850 mg/l/4h |
| ATE US (dust, mist)        | 1850 mg/l/4h |

Skin corrosion/irritation : Not classified

Serious eye damage/irritation : Not classified

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity – single exposure : Not classified

Specific target organ toxicity – repeated exposure : Not classified

Aspiration hazard : May be fatal if swallowed and enters airways.

Symptoms/effects after ingestion : Risk of lung edema.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

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| Isododecane (13475-82-6) |   |
|--------------------------|---|
| LC50 fish 1              | > 1000 mg/l (Exposure time: 96 h, Species: Oncorhynchus Mykiss) |

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

| Isododecane (13475-82-6) |      |
|--------------------------|------|
| Log Pow                  | 5.94 |

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Disposal methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.  
Additional information : Flammable vapors may accumulate in the container.

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN2286 Pentamethylheptane, 3, III  
UN-No.(DOT) : UN2286  
Proper Shipping Name (DOT) : Pentamethylheptane  
Class (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120  
Packing group (DOT) : III - Minor Danger  
Hazard labels (DOT) : 3 - Flammable liquid



DOT Packaging Non Bulk (49 CFR 173.xxx) : 203  
DOT Packaging Bulk (49 CFR 173.xxx) : 242  
DOT Special Provisions (49 CFR 172.102) : B1 - If the material has a flash point at or above 38 C (100 F) and below 93 C (200 F), then the bulk packaging requirements of 173.241 of this subchapter are applicable. If the material has a flash point of less than 38 C (100 F), then the bulk packaging requirements of 173.242 of this subchapter are applicable.  
IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).  
T2 - 1.5 178.274(d)(2) Normal..... 178.275(d)(3)  
TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling =  $97 / 1 + a (tr - tf)$  Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.  
DOT Packaging Exceptions (49 CFR 173.xxx) : 150  
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 60 L  
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 220 L  
DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.  
Emergency Response Guide (ERG) Number : 128

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Other information : No supplementary information available.

### Transport by sea

Transport document description (IMDG) : UN 2286 PENTAMETHYLHEPTANE, 3, III (43°C c.c.)  
UN-No. (IMDG) : 2286  
Proper Shipping Name (IMDG) : PENTAMETHYLHEPTANE  
Class (IMDG) : 3 - Flammable liquids  
Packing group (IMDG) : III - substances presenting low danger

### Air transport

Transport document description (IATA) : UN 2286 Pentamethylheptane, 3, III  
UN-No. (IATA) : 2286  
Proper Shipping Name (IATA) : Pentamethylheptane  
Class (IATA) : 3 - Flammable Liquids  
Packing group (IATA) : III - Minor Danger

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Isododecane (13475-82-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

#### CANADA

#### Isododecane (13475-82-6)

Listed on the Canadian DSL (Domestic Substances List)

#### EU-Regulations

#### Isododecane (13475-82-6)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

#### National regulations

#### Isododecane (13475-82-6)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Japanese ISHL (Industrial Safety and Health Law)  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Listed on CICR (Turkish Inventory and Control of Chemicals)  
Listed on the TCSI (Taiwan Chemical Substance Inventory)

### 15.3. US State regulations

No additional information available

## SECTION 16: Other information

Revision date : 06/19/2018

Full text of H-phrases:

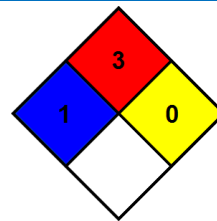
|      |  |
|------|--|
| H226 | Flammable liquid and vapour                  |
| H304 | May be fatal if swallowed and enters airways |

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|                    |   |
|--------------------|---|
| NFPA health hazard | : 1 - Materials that, under emergency conditions, can cause significant irritation.   |
| NFPA fire hazard   | : 3 - Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions. |
| NFPA reactivity    | : 0 - Material that in themselves are normally stable, even under fire conditions.  |



SDS US (GHS HazCom 2012)

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