SAFETY DATA SHEET
D2887 Boiling Point Calibration Mix C5-C44, Part Number G3440-85037

Section 1. Identification

Product identifier : D2887 Boiling Point Calibration Mix C5-C44, Part Number G3440-85037
Part no. : G3440-85037

Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Reagents and Standards for Analytical Chemistry Laboratory Use
5 x 1 ml (2 ml ampoule)

Supplier/Manufacturer : Agilent Technologies, Inc.
5301 Stevens Creek Blvd
Santa Clara, CA 95051, USA
800-227-9770

Emergency telephone number (with hours of operation) : CHEMTREC®: 1-800-424-9300

Section 2. Hazard identification

Classification of the substance or mixture

- H226 - FLAMMABLE LIQUIDS - Category 3
- H315 - SKIN IRRITATION - Category 2
- H319 - EYE IRRITATION - Category 2A
- H361 - TOXIC TO REPRODUCTION - Category 2
- H335 - SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
- H336 - SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
- H373 - SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
- H304 - ASPIRATION HAZARD - Category 1
- H411 - AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements :
- H226 - Flammable liquid and vapor.
- H304 - May be fatal if swallowed and enters airways.
- H315 - Causes skin irritation.
- H319 - Causes serious eye irritation.
- H335 - May cause respiratory irritation.
- H336 - May cause drowsiness or dizziness.
- H361 - Suspected of damaging fertility or the unborn child.
- H373 - May cause damage to organs through prolonged or repeated exposure.
  (central nervous system (CNS), nervous system)
- H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements
Section 2. Hazard identification

Prevention:
P201 - Obtain special instructions before use.
P280 - Wear protective gloves, protective clothing and eye or face protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273 - Avoid release to the environment.
P260 - Do not breathe vapor.
P264 - Wash thoroughly after handling.

Response:
P391 - Collect spillage.
P308 + P313 - IF exposed or concerned: Get medical advice or attention.
P304 + P312 - IF INHALED: Call a POISON CENTER or doctor if you feel unwell.
P301 + P310, P331 - IF SWALLOWED: Immediately call a POISON CENTER or doctor. Do NOT induce vomiting.
P362 + P364 - Take off contaminated clothing and wash it before reuse.
P302 + P352 - IF ON SKIN: Wash with plenty of water.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 - If eye irritation persists: Get medical advice or attention.

Storage:
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.

Disposal:
P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements:
- Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 61%

Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substance/mixture</th>
<th>Mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ingredient name</strong></td>
<td><strong>Synonyms</strong></td>
</tr>
<tr>
<td>dodecane</td>
<td>n-Dodecane</td>
</tr>
<tr>
<td>tetradecane</td>
<td>n-Tetradecane</td>
</tr>
<tr>
<td>hexadecane</td>
<td>n-Hexadecane</td>
</tr>
<tr>
<td>pentane</td>
<td>Pentane</td>
</tr>
<tr>
<td>decane</td>
<td>Decane</td>
</tr>
<tr>
<td>undecane</td>
<td>Undecane</td>
</tr>
<tr>
<td>heptane</td>
<td>n-Heptane</td>
</tr>
<tr>
<td>octane</td>
<td>n-Octane</td>
</tr>
<tr>
<td>nonane</td>
<td>Nonane</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>Hexane</td>
</tr>
<tr>
<td>pentadecane</td>
<td>n-Pentadecane</td>
</tr>
<tr>
<td>n-Heptadecane</td>
<td>Heptadecane (C17)</td>
</tr>
<tr>
<td>octadecane</td>
<td>Octadecane</td>
</tr>
<tr>
<td>icosane</td>
<td>n-Eicosane</td>
</tr>
</tbody>
</table>

Ranges if listed above for hazardous ingredient(s) are prescribed ranges. The actual concentration(s) or actual concentration range(s) are being withheld as a trade secret.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.
Section 3. Composition/information on ingredients

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

**Description of necessary first aid measures**

**Eye contact**
- Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

**Inhalation**
- Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin contact**
- Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**
- Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Most important symptoms/effects, acute and delayed**

**Potential acute health effects**

**Eye contact**
- Causes serious eye irritation.

**Inhalation**
- Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness. May cause respiratory irritation.

**Skin contact**
- Causes skin irritation.

**Ingestion**
- Can cause central nervous system (CNS) depression. May be fatal if swallowed and enters airways.

**Over-exposure signs/symptoms**

**Eye contact**
- Adverse symptoms may include the following:
  - pain or irritation
  - watering
  - redness

**Inhalation**
- Adverse symptoms may include the following:
  - respiratory tract irritation
  - coughing
  - nausea or vomiting
  - headache
  - drowsiness/fatigue
  - dizziness/vertigo
  - unconsciousness
  - reduced fetal weight
  - increase in fetal deaths
  - skeletal malformations
Section 4. First-aid measures

**Skin contact**
- Adverse symptoms may include the following:
  - irritation
  - redness
  - reduced fetal weight
  - increase in fetal deaths
  - skeletal malformations

**Ingestion**
- Adverse symptoms may include the following:
  - nausea or vomiting
  - reduced fetal weight
  - increase in fetal deaths
  - skeletal malformations

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

**Notes to physician**
- Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments**
- No specific treatment.

**Protection of first-aiders**
- No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**
- Use dry chemical, CO₂, water spray (fog) or foam.

**Unsuitable extinguishing media**
- Do not use water jet.

**Specific hazards arising from the chemical**
- Flammable liquid and vapor. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products**
- Decomposition products may include the following materials:
  - carbon dioxide
  - carbon monoxide

**Special protective actions for fire-fighters**
- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters**
- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Methods for cleaning up: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not swallow. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
## Section 8. Exposure controls/personal protection

### Control parameters

### Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
</table>
| **Pentane**     | CA Alberta Provincial (Canada, 6/2018). [Pentane]  
8 hrs OEL: 600 ppm 8 hours.  
8 hrs OEL: 1770 mg/m³ 8 hours.  
CA British Columbia Provincial (Canada, 6/2021). [pentane, all isomers]  
TWA: 1000 ppm 8 hours.  
CA Ontario Provincial (Canada, 6/2019). [Pentane, all isomers]  
TWA: 1000 ppm 8 hours.  
CA Quebec Provincial (Canada, 6/2021). [pentane]  
TWAEV: 1000 ppm 8 hours.  
CA Saskatchewan Provincial (Canada, 7/2013). [Pentane]  
STEL: 750 ppm 15 minutes.  
TWA: 600 ppm 8 hours. |
| **Heptane**     | CA Alberta Provincial (Canada, 6/2018). [Heptane]  
15 min OEL: 2050 mg/m³ 15 minutes.  
8 hrs OEL: 1640 mg/m³ 8 hours.  
8 hrs OEL: 400 ppm 8 hours.  
15 min OEL: 500 ppm 15 minutes.  
CA British Columbia Provincial (Canada, 6/2021). [heptane, Isomers]  
TWA: 400 ppm 8 hours.  
STEL: 500 ppm 15 minutes.  
CA Ontario Provincial (Canada, 6/2019). [Heptane, all isomers]  
TWA: 400 ppm 8 hours.  
STEL: 500 ppm 15 minutes.  
CA Quebec Provincial (Canada, 6/2021). [heptane]  
TWAEV: 400 ppm 8 hours.  
STEV: 500 ppm 15 minutes.  
CA Saskatchewan Provincial (Canada, 7/2013).  
STEL: 500 ppm 15 minutes.  
TWA: 400 ppm 8 hours. |
| **Octane**      | CA Alberta Provincial (Canada, 6/2018). [Octane]  
8 hrs OEL: 300 ppm 8 hours.  
8 hrs OEL: 1400 mg/m³ 8 hours.  
CA British Columbia Provincial (Canada, 6/2021). [Octane, all isomers]  
TWA: 300 ppm 8 hours.  
CA Ontario Provincial (Canada, 6/2019). [Octane, all isomers]  
TWA: 300 ppm 8 hours.  
CA Quebec Provincial (Canada, 6/2021).  
TWAEV: 300 ppm 8 hours.  
CA Saskatchewan Provincial (Canada, 7/2013). [Octane] |
Section 8. Exposure controls/personal protection

<table>
<thead>
<tr>
<th>Chemical</th>
<th>STEL</th>
<th>TWA</th>
<th>CA Alberta Provincial (Canada, 6/2018)</th>
<th>CA British Columbia Provincial (Canada, 6/2021)</th>
<th>CA Ontario Provincial (Canada, 6/2019)</th>
<th>CA Quebec Provincial (Canada, 6/2021)</th>
<th>CA Saskatchewan Provincial (Canada, 7/2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonane</td>
<td>375 ppm</td>
<td>300 ppm</td>
<td>8 hrs OEL: 1050 mg/m³ 8 hours.</td>
<td>8 hrs OEL: 200 ppm 8 hours.</td>
<td>200 ppm 8 hours.</td>
<td>200 ppm 8 hours.</td>
<td>STEL: 250 ppm 15 minutes. TWA: 200 ppm 8 hours.</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>62.5 ppm</td>
<td>50 ppm</td>
<td>8 hrs OEL: 50 ppm 8 hours.</td>
<td>8 hrs OEL: 176 mg/m³ 8 hours.</td>
<td>20 ppm 8 hours.</td>
<td>50 ppm 8 hours.</td>
<td>STEL: 62.5 ppm 15 minutes. TWA: 50 ppm 8 hours.</td>
</tr>
</tbody>
</table>

**Biological exposure indices**

None known.

**Appropriate engineering controls**

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Environmental exposure controls**

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

**Individual protection measures**

**Hygiene measures**

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Section 8. Exposure controls/personal protection

**Eye/face protection**: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

**Skin protection**

**Hand protection**: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body protection**: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

**Other skin protection**: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection**: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

**Appearance**

Physical state : Liquid.
Color : Colorless.
Odor : mild gasoline [Slight]
Odor threshold : Not available.
pH : Not available.
Melting point/freezing point : Not available.
Boiling point, initial boiling point, and boiling range : >35°C (>95°F)
Flash point : Closed cup: 23 to 37.8°C (73.4 to 100°F)
Evaporation rate : <1 (butyl acetate = 1)
Flammability : Not applicable.
Lower and upper explosion limit/flammability limit : Lower: 1.5%
Upper: 7.6%

**Vapor pressure**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Vapor Pressure at 20°C</th>
<th>Vapor pressure at 50°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm Hg</td>
<td>kPa</td>
</tr>
<tr>
<td>Pentane</td>
<td>442.84</td>
<td>59</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>127.51</td>
<td>17</td>
</tr>
</tbody>
</table>

Relative vapor density : Not available.
Section 9. Physical and chemical properties and safety characteristics

Relative density : Not available.

Solubility(ies) : Media Result
- Water Insoluble

Miscible with water : No.

Partition coefficient: n-octanol/water : Not applicable.

Auto-ignition temperature : Ingredient name °C °F Method
- Dodecane 200 392
- Pentadecane 200 392

Decomposition temperature : Not available.

Viscosity : Not available.

Particle characteristics

Median particle size : Not applicable.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials

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

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dodecane</td>
<td>LD50 Dermal</td>
<td>Rabbit - Male, Female</td>
<td>&gt;5000 mg/kg</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat - Male, Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Tetradecane</td>
<td>LC50 Inhalation Ducts and mists</td>
<td>Rat</td>
<td>9.3 mg/l</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit - Male, Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat - Male, Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Hexadecane</td>
<td>LC50 Inhalation Ducts and mists</td>
<td>Rat</td>
<td>&gt;5266 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor</td>
<td>Rat</td>
<td>364 g/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat - Male,</td>
<td>&gt;2000 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>
### Section 11. Toxicological information

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decane</strong></td>
<td>LD50 Dermal Female Rabbit - Male, Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD50 Oral Male Rabbit - Male, Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD50 Oral Male Rabbit - Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>undecane</strong></td>
<td>LD50 Oral Male Rabbit - Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Heptane</strong></td>
<td>LC50 Inhalation Vapor Male Rat</td>
<td>103 g/m³</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor Female Rat</td>
<td>48000 ppm</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Octane</strong></td>
<td>LC50 Inhalation Vapor Male Rat</td>
<td>118 g/m³</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor Female Rat</td>
<td>25260 ppm</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>nonane</strong></td>
<td>LC50 Inhalation Vapor Male Rat</td>
<td>17000 ppm</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor Female Rat</td>
<td>3200 ppm</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Heptane</strong></td>
<td>LD50 Oral Male Rabbit - Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>n-Hexane</strong></td>
<td>LC50 Inhalation Vapor Male Rat</td>
<td>169.2 mg/l</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation Vapor Female Rat</td>
<td>48000 ppm</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pentadecane</strong></td>
<td>LD50 Oral Male Rabbit - Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Octadecane</strong></td>
<td>LC50 Inhalation Dusts and mists Male Rat</td>
<td>&gt;5266 mg/m³</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Icosane</strong></td>
<td>LC50 Inhalation Dusts and mists Male Rat</td>
<td>&gt;5266 mg/m³</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD50 Oral Male Rabbit - Female</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Irritation/Corrosion

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>dodecane</strong></td>
<td>Skin - Moderate irritant Rabbit</td>
<td>-</td>
<td>24 hours</td>
<td>0.05 mL</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Moderate irritant Rat</td>
<td>-</td>
<td>96 hours</td>
<td>300 uL</td>
<td>-</td>
</tr>
<tr>
<td><strong>Tetradecane</strong></td>
<td>Skin - Moderate irritant Rabbit</td>
<td>-</td>
<td>24 hours</td>
<td>0.05 mL</td>
<td>-</td>
</tr>
<tr>
<td><strong>Hexadecane</strong></td>
<td>Skin - Severe irritant Rat</td>
<td>-</td>
<td>24 hours</td>
<td>100 mg</td>
<td>-</td>
</tr>
<tr>
<td><strong>nonane</strong></td>
<td>Skin - Moderate irritant Rat</td>
<td>-</td>
<td>96 hours</td>
<td>300 uL</td>
<td>-</td>
</tr>
<tr>
<td><strong>n-Hexane</strong></td>
<td>Eyes - Mild irritant Rabbit</td>
<td>-</td>
<td>10 mg</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

#### Conclusion/Summary

**Skin**
- Repeated exposure may cause skin dryness or cracking.

#### Sensitization
- Not available.

#### Mutagenicity
- **Conclusion/Summary** : Not available.

#### Carcinogenicity
- **Conclusion/Summary** : Not available.

#### Reproductive toxicity
- **Conclusion/Summary** : Not available.

#### Teratogenicity
- **Conclusion/Summary** : Not available.

### Specific target organ toxicity (single exposure)
Section 11. Toxicological information

### Information on the likely routes of exposure

Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

### Potential acute health effects

- **Eye contact**: Causes serious eye irritation.
- **Inhalation**: Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness. May cause respiratory irritation.
- **Skin contact**: Causes skin irritation.

### Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dodecane</td>
<td>Category 3</td>
<td>-</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Tetradecane</td>
<td>Category 3</td>
<td>-</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Hexadecane</td>
<td>Category 3</td>
<td>-</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Pentane</td>
<td>Category 3</td>
<td>-</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>Decane</td>
<td>Category 3</td>
<td>-</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>Heptane</td>
<td>Category 3</td>
<td>-</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Octane</td>
<td>Category 3</td>
<td>-</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>Nonane</td>
<td>Category 3</td>
<td>-</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>Category 3</td>
<td>-</td>
<td>Narcotic effects</td>
</tr>
</tbody>
</table>

### Aspiration hazard

<table>
<thead>
<tr>
<th>Name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2887 Boiling Point Calibration Mix C5-C44, Part Number G3440-85037</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Dodecane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Tetradecane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Hexadecane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Pentane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Decane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Undecane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Heptane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Octane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Nonane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Pentadecane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>n-Heptadecane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Octadecane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Icosane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
</tbody>
</table>
Section 11. Toxicological information

**Ingestion**: Can cause central nervous system (CNS) depression. May be fatal if swallowed and enters airways.

**Symptoms related to the physical, chemical and toxicological characteristics**

**Eye contact**: Adverse symptoms may include the following:
- pain or irritation
- watering
- redness

**Inhalation**: Adverse symptoms may include the following:
- respiratory tract irritation
- coughing
- nausea or vomiting
- headache
- drowsiness/fatigue
- dizziness/vertigo
- unconsciousness
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

**Skin contact**: Adverse symptoms may include the following:
- irritation
- redness
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

**Ingestion**: Adverse symptoms may include the following:
- nausea or vomiting
- reduced fetal weight
- increase in fetal deaths
- skeletal malformations

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Short term exposure**

- **Potential immediate effects**: Not available.
- **Potential delayed effects**: Not available.

**Long term exposure**

- **Potential immediate effects**: Not available.
- **Potential delayed effects**: Not available.

**Potential chronic health effects**

- **General**: May cause damage to organs through prolonged or repeated exposure.
- **Carcinogenicity**: No known significant effects or critical hazards.
- **Mutagenicity**: No known significant effects or critical hazards.
- **Reproductive toxicity**: Suspected of damaging fertility or the unborn child.

**Numerical measures of toxicity**

**Acute toxicity estimates**
### Section 11. Toxicological information

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Oral (mg/kg)</th>
<th>Dermal (mg/kg)</th>
<th>Inhalation (gases) (ppm)</th>
<th>Inhalation (vapors) (mg/l)</th>
<th>Inhalation (dusts and mists) (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2887 Boiling Point Calibration Mix C5-C44, Part Number G3440-85037</td>
<td>27812.5</td>
<td>N/A</td>
<td>N/A</td>
<td>153.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Tetradecane</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>9.3</td>
</tr>
<tr>
<td>pentane</td>
<td>2500</td>
<td>N/A</td>
<td>N/A</td>
<td>364</td>
<td>N/A</td>
</tr>
<tr>
<td>Heptane</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>103</td>
<td>N/A</td>
</tr>
<tr>
<td>Octane</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>118</td>
<td>N/A</td>
</tr>
<tr>
<td>nonane</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>17</td>
<td>N/A</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>15840</td>
<td>N/A</td>
<td>N/A</td>
<td>169.2</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Section 12. Ecological information

#### Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decane</td>
<td>Acute EC50 &gt;500000 µg/l Marine water&lt;br&gt;Acute LC50 18000 µg/l Fresh water&lt;br&gt;Acute LC50 &gt;500 ppm Marine water</td>
<td>Algae - Skeletonema costatum&lt;br&gt;Daphnia - Daphnia magna&lt;br&gt;Fish - Cyprinodon variegatus - Juvenile (Fledgling, Hatchling, Weanling)</td>
<td>96 hours&lt;br&gt;48 hours&lt;br&gt;96 hours</td>
</tr>
<tr>
<td>Heptane</td>
<td>Acute LC50 375000 µg/l Fresh water</td>
<td>Fish - Oreochromis mossambicus&lt;br&gt;Daphnia - Daphnia magna&lt;br&gt;Fish - Pimephales promelas</td>
<td>96 hours&lt;br&gt;21 days&lt;br&gt;96 hours</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>Chronic NOEC 0.17 mg/l Fresh water&lt;br&gt;Acute LC50 2500 µg/l Fresh water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Persistence and degradability

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Result</th>
<th>Dose</th>
<th>Inoculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexadecane</td>
<td>OECD 306 Biodegradability in Seawater&lt;br&gt;Orex 301F Ready Biodegradability - Manometric Respirometry Test</td>
<td>28 % - Readily - 74 days</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>pentane</td>
<td>OECD 301F Ready Biodegradability - Manometric Respirometry Test</td>
<td>87 % - Readily - 28 days</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pentadecane</td>
<td>OECD 306 Biodegradability in Seawater&lt;br&gt;Orex 301F Ready Biodegradability - Manometric Respirometry Test</td>
<td>74 % - Readily - 28 days</td>
<td>1 mg/l</td>
<td>-</td>
</tr>
<tr>
<td>Icosane</td>
<td>OECD 306 Biodegradability in Seawater&lt;br&gt;Orex 301F Ready Biodegradability - Manometric Respirometry Test</td>
<td>74 % - 28 days</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Section 12. Ecological information

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Aquatic half-life</th>
<th>Photolysis</th>
<th>Biodegradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>dodecane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Tetradecane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Hexadecane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>pentane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Decane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>undecane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Heptane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Octane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>nonane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Pentadecane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>n-Heptadecane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Octadecane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Icosane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
</tbody>
</table>

**Bioaccumulative potential**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP_{ow}</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>dodecane</td>
<td>6.98</td>
<td>239.88</td>
<td>low</td>
</tr>
<tr>
<td>Tetradecane</td>
<td>8.11</td>
<td>-</td>
<td>high</td>
</tr>
<tr>
<td>Hexadecane</td>
<td>8.2</td>
<td>5011.87</td>
<td>high</td>
</tr>
<tr>
<td>pentane</td>
<td>3.45</td>
<td>171</td>
<td>low</td>
</tr>
<tr>
<td>Decane</td>
<td>5.86</td>
<td>-</td>
<td>high</td>
</tr>
<tr>
<td>undecane</td>
<td>6.42</td>
<td>-</td>
<td>high</td>
</tr>
<tr>
<td>Heptane</td>
<td>4.66</td>
<td>552</td>
<td>high</td>
</tr>
<tr>
<td>Octane</td>
<td>5.18</td>
<td>198.7</td>
<td>low</td>
</tr>
<tr>
<td>nonane</td>
<td>5.65</td>
<td>105</td>
<td>low</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>4</td>
<td>501.187</td>
<td>high</td>
</tr>
<tr>
<td>Pentadecane</td>
<td>7.71</td>
<td>-</td>
<td>high</td>
</tr>
<tr>
<td>Octadecane</td>
<td>10.37</td>
<td>-</td>
<td>high</td>
</tr>
<tr>
<td>Icosane</td>
<td>11.46</td>
<td>-</td>
<td>high</td>
</tr>
</tbody>
</table>

**Mobility in soil**

Soil/water partition coefficient (K_{oc}) : Not available.

**Other adverse effects**

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Section 14. Transport information

TDG / IMDG / IATA : Not regulated.

Additional information

Remarks: De minimis quantities

Special precautions for user : Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

Canadian lists

Canadian NPRI : The following components are listed: pentane (all isomers); decane (all isomers); heptane (all isomers); octane (all isomers); nonane (all isomers); n-hexane

CEPA Toxic substances : None of the components are listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals
Not listed.

Montreal Protocol
Not listed.

Stockholm Convention on Persistent Organic Pollutants
Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)
Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals
Not listed.

Inventory list

Australia : Not determined.
Canada : At least one component is not listed in DSL but all such components are listed in NDSL.
China : Not determined.
Eurasian Economic Union : Russian Federation inventory: All components are listed or exempted.
Japan : Japan inventory (CSCL): Not determined.
Japan inventory (ISHL): Not determined.
New Zealand : All components are listed or exempted.
Philippines : Not determined.
Republic of Korea : Not determined.
Taiwan : All components are listed or exempted.
Thailand : Not determined.
Turkey : Not determined.
United States : All components are active or exempted.
Viet Nam : Not determined.
Section 16. Other information

History
- Date of issue/Date of revision: 09/30/2022
- Date of previous issue: 07/22/2019
- Version: 5

Key to abbreviations:
- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- HPR = Hazardous Products Regulations
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- N/A = Not available
- UN = United Nations

Procedure used to derive the classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAMMABLE LIQUIDS - Category 3</td>
<td>On basis of test data</td>
</tr>
<tr>
<td>SKIN IRRITATION - Category 2</td>
<td>Calculation method</td>
</tr>
<tr>
<td>EYE IRRITATION - Category 2A</td>
<td>Calculation method</td>
</tr>
<tr>
<td>TOXIC TO REPRODUCTION - Category 2</td>
<td>Calculation method</td>
</tr>
<tr>
<td>SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3</td>
<td>Calculation method</td>
</tr>
<tr>
<td>SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3</td>
<td>Calculation method</td>
</tr>
<tr>
<td>SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2</td>
<td>Calculation method</td>
</tr>
<tr>
<td>ASPIRATION HAZARD - Category 1</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>AQUATIC HAZARD (LONG-TERM) - Category 2</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

* Indicates information that has changed from previously issued version.

Notice to reader

Disclaimer: The information contained in this document is based on Agilent’s state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.