

# SAFETY DATA SHEET

Classified in accordance with Health Canada Hazardous Products Regulations (SOR/2015-17)

## 1. Identification

**Product identifier:** Gasoline Blendstock C6-C8**Other means of identification****Common name(s),** Blended Reformate/Raffinate**synonym(s):****SDS number:** NOVA-0021**Recommended use and restriction on use****Recommended use:** Petrochemical industry: Raw material.**Restrictions on use:** All uses other than the identified.**Manufacturer/Importer/Supplier/Distributor Information****Manufacturer**

Company Name: NOVA Chemicals  
Address: P.O. Box 2518, Station M  
Calgary, Alberta, Canada T2P 5C6  
Telephone: Product Information: 1-412-490-4063  
SDS Information Email: [msdsemail@novachem.com](mailto:msdsemail@novachem.com)

**Emergency telephone number:**

1-800-561-6682, 1-403-314-8767 (NOVA Chemicals) (24 hours)

## 2. Hazard(s) identification

**Hazard Classification According to Hazardous Products Regulations****Physical Hazards**

Flammable liquids Category 2  
Static-accumulating flammable liquid Category 1

**Health Hazards**

Acute toxicity (Oral) Category 4  
Skin Corrosion/Irritation Category 2  
Serious Eye Damage/Eye Irritation Category 2A  
Germ Cell Mutagenicity Category 1B  
Carcinogenicity Category 1A  
Reproductive toxicity Category 2  
Specific Target Organ Toxicity -  
Single Exposure Category 3  
Specific Target Organ Toxicity -  
Repeated Exposure Category 1  
Specific Target Organ Toxicity -  
Repeated Exposure Category 2  
Aspiration Hazard Category 1

**Environmental Hazards**

Acute hazards to the aquatic  
environment Category 1  
Chronic hazards to the aquatic  
environment Category 1

**Label Elements****Hazard Symbol:****Signal Word:**

Danger

**Hazard Statement:**

Highly flammable liquid and vapour.  
Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment.  
Sparks may ignite liquid and vapour.  
May cause flash fire or explosion.  
Harmful if swallowed.  
Causes skin irritation.  
Causes serious eye irritation.  
May cause genetic defects.  
May cause cancer.  
Suspected of damaging fertility or the unborn child.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
Causes damage to organs through prolonged or repeated exposure.  
(Blood)  
May cause damage to organs through prolonged or repeated exposure.  
(Nervous System)  
(Hearing organs)  
(Central nervous system)  
May be fatal if swallowed and enters airways.  
Very toxic to aquatic life with long lasting effects.

**Precautionary Statements:****Prevention:**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical, ventilating and lighting equipment. Use non-sparking tools. Take action to prevent static discharges. These alone may be insufficient to remove static electricity. Do not breathe dust or mists. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

**Response:**

IF SWALLOWED: Immediately call a POISON CENTRE/doctor. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE/doctor if you feel unwell. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF exposed or concerned: Get medical advice/attention. In case of fire: Use dry chemical, foam, carbon

dioxide (CO<sub>2</sub>), water spray or fog to extinguish. Collect spillage.

**Storage:** Store in a well-ventilated place. Keep container tightly closed. Store locked up. Keep cool.

**Disposal:** Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

**Other hazards which do not result in GHS classification:** None.

### 3. Composition/information on ingredients

#### Mixtures

| Chemical Identity                                  | Common name and synonyms      | CAS number | Content in percent (%)* |
|--|-------------------------------|------------|-------------------------|
| Cyclopentane, methyl-                              | Methylcyclopentane            | 96-37-7    | 10 - 25%                |
| Cyclohexane  | Benzene hexahydride           | 110-82-7   | 10 - 25%                |
| Hexane   | n-Hexane                      | 110-54-3   | 2 - 25%                 |
| Cyclopentane                                       | Pentamethylene                | 287-92-3   | 4 - 15%                 |
| 4,7-Methano-1H-indene,<br>3a,4,5,6,7,7a-hexahydro- | Dihydrodicyclopentadiene      | 4488-57-7  | 0 - 12%                 |
| Pentane, 2-methyl-                                 | Isohexane                     | 107-83-5   | 2 - 10%                 |
| Octane   | n-Octane                      | 111-65-9   | 1 - 10%                 |
| Cyclohexane, methyl-                               | Methylcyclohexane             | 108-87-2   | 0 - 5%                  |
| n-Pentane  | Pentane                       | 109-66-0   | 0 - 5%                  |
| Heptane, 3-methyl-                                 | 3-Methylheptane               | 589-81-1   | 0 - 5%                  |
| Pentane, 3-methyl-                                 | 3-Methylpentane               | 96-14-0    | 0 - 5%                  |
| 1-ethyl-1-methylcyclohexane                        | Cyclohexane, ethylmethyl-     | 4926-90-3  | 0 - 5%                  |
| Benzene, ethyl-                                    | Ethylbenzene, Phenylethane    | 100-41-4   | 0.1 - 4%                |
| Benzene, dimethyl-                                 | Xylene (mixed isomers)        | 1330-20-7  | 0.1 - 3%                |
| Cyclohexane, (1-methylethyl)-                      | Isopropylcyclohexane          | 696-29-7   | 0 - 3%                  |
| Cyclohexane, ethyl-                                | Ethylcyclohexane              | 1678-91-7  | 0 - 3%                  |
| Pentane, 2,3-dimethyl-                             | 2,3-Dimethylpentane           | 565-59-3   | 0 - 3%                  |
| Toluene  | Methylbenzene                 | 108-88-3   | 0.1 - 2%                |
| Hexane, 2-methyl-                                  | 2-Methylhexane                | 591-76-4   | 0 - 2%                  |
| n-Undecane   | Undecane                      | 1120-21-4  | 0 - 2%                  |
| Benzene  | Benzol                        | 71-43-2    | 0 - 1.5%                |
| Heptane  | n-Heptane                     | 142-82-5   | 0 - 1%                  |
| Nonane   | n-Nonane                      | 111-84-2   | 0 - 1%                  |
| 2-Methylbutane                                     | Isopentane                    | 78-78-4    | 0 - 1%                  |
| Pentane, 2,4-dimethyl-                             | 2,4-Dimethylpentane           | 108-08-7   | 0 - 1%                  |
| 2,2-Dimethylpentane                                | Pentane, 2,2-dimethyl-        | 590-35-2   | 0 - 1%                  |
| 3,3-Dimethylhexane                                 | Hexane, 3,3-dimethyl-         | 563-16-6   | 0 - 1%                  |
| 2,2,3,4-Tetramethylpentane                         | Pentane, 2,2,3,4-tetramethyl- | 1186-53-4  | 0 - 1%                  |
| Hexane, 3-methyl-                                  | 3-Methylhexane                | 589-34-4   | 0 - 0.8%                |
| Pentane, 3-ethyl-                                  | 3-Ethylpentane                | 617-78-7   | 0 - 0.5%                |
| 2-Methylheptane                                    | Heptane, 2-methyl-            | 592-27-8   | 0 - 0.5%                |
| Hexane, 3,4-dimethyl-                              | 3,4-Dimethylhexane            | 583-48-2   | 0 - 0.2%                |
| Hexane, 3-ethyl-                                   | 3-Ethylhexane                 | 619-99-8   | 0 - 0.125%              |

\* All concentrations are percent by weight.

#### Additional Information:

This product has been assigned a CAS # of 68333-81-3 - Alkanes, C4-12. This product is considered hazardous by the Hazardous Products

Regulations, 2015.

**4. First-aid measures**

|                      |  |
|----------------------|--|
| <b>Inhalation:</b>   | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE/doctor if you feel unwell.   |
| <b>Ingestion:</b>    | IF SWALLOWED: Immediately call a POISON CENTRE/doctor. Rinse mouth. Do NOT induce vomiting.  |
| <b>Skin Contact:</b> | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention. |
| <b>Eye contact:</b>  | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.                                 |

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

|                  |   |
|------------------|---|
| <b>Symptoms:</b> | Skin irritation. Eye irritation. Respiratory irritation. Drowsiness. Dizziness. |
|------------------|---|

**Indication of immediate medical attention and special treatment needed**

|                   |   |
|-------------------|---|
| <b>Treatment:</b> | For more detailed medical emergency support information, call 1-800-561-6682 or 1-403-314-8767 (24 hours, NOVA Chemicals Emergency Response). Ensure thorough eye and skin decontamination. Treat unconsciousness, nausea, hypotension, seizures and cardiac arrhythmias in the conventional manner. Aspiration of this product during induced emesis can result in lung injury. If evacuation of stomach contents is considered necessary, use the method least likely to cause aspiration, such as gastric lavage after protecting the airway. Observe hospitalized patients for delayed chemical pneumonia, acute tubular necrosis, encephalopathy and dysrhythmias. Monitor for urinary phenol within 72 hours of acute exposure. |
|-------------------|---|

**5. Fire-fighting measures**

|                              |  |
|------------------------------|--|
| <b>General Fire Hazards:</b> | Highly flammable liquid and vapour. Presence of strong oxidizers can increase fire and explosion hazard. Vapours are heavier than air and may travel to a source of ignition and flash back. Closed containers may rupture violently when heated. If tank, rail car or tank truck is involved in fire, ISOLATE for 800 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions. Vapours may form explosive mixture with air. Keep containers away from source of heat or fire. This product may be a static accumulator which can form an ignitable vapour-air mixture in a storage tank. |
|------------------------------|--|

**Suitable (and unsuitable) extinguishing media**

|  |  |
|--|--|
| <b>Suitable extinguishing media:</b>               | Use dry chemical, foam, carbon dioxide (CO <sub>2</sub> ), water spray or fog to extinguish. Use water to cool fire-exposed containers and to protect personnel. |
| <b>Unsuitable extinguishing media:</b>             | Do not use straight/direct streams as this may actually spread flames.   |
| <b>Specific hazards arising from the chemical:</b> | Upon combustion, this product emits carbon monoxide, carbon dioxide, low molecular weight hydrocarbons.  |

**Special protective equipment and precautions for firefighters****Special fire fighting procedures:**

Keep upwind. Keep unauthorized personnel away. Move containers from fire area if you can do so without risk. Fight fire from maximum distance or use unmanned holders or monitor nozzles. Immediately withdraw in case of fire and container venting or heat discoloration of a container. Avoid inhaling any smoke and combustion materials. Remove and isolate contaminated clothing and shoes. Cool containers with flooding quantities of water until well after the fire is out. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Reference Emergency Response Guidebook No. 128 for additional details and instructions.

**Special protective equipment for firefighters:**

Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

**6. Accidental release measures****Personal precautions, protective equipment and emergency procedures:**

Isolate area. Keep unauthorized personnel away. Alert stand-by emergency and fire fighting personnel. Monitor surrounding area for buildup of flammable concentrations in air.

**Methods and material for containment and cleaning up:**

Wear appropriate personal protective equipment. Do not touch or walk through spilled material. In case of leakage, eliminate all ignition sources. As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (164 feet) in all directions. Keep upwind. Keep out of low areas. Stop leak if safe to do so. Contain discharge by booming on water or diking on ground. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply.

**Small Spills:** Remove liquid material with non-sparking approved pumps, skimmers or vacuum equipment. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Use non-sparking tools.

**Large Spills:** Consider downwind evacuation for 300 metres (1000 feet). Spills on water will volatilize rapidly, making containment or recovery difficult. A vapour-suppressing foam may be used to reduce vapours. Remove pooled liquid material with approved, non-sparking pumps, skimmers or vacuum equipment. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Soil remediation may be required.

**7. Handling and storage****Precautions for safe handling:**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical, ventilating and lighting equipment. Use non-sparking tools. Take action to prevent static discharges. These alone may be insufficient to remove static electricity. For additional information on equipment bonding and grounding, refer to the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity". For additional information on storing and handling flammable liquids, refer to the National Fire Protection Association (NFPA) 30, "Flammable and Combustible Liquids Code". Take special precautions when cold cutting or breaking into lines, or when cleaning and disposing of empty containers. Parts and equipment should

be steam cleaned prior to maintenance procedures. Do not breathe dust or mists. Avoid contact with skin and eyes. Keep away from incompatible materials such as oxidizing agents and acids. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using the product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. In case of inadequate ventilation, use respiratory protection.

**Conditions for safe storage, including any incompatibilities:**

Storage area should be clearly identified, well-illuminated and clear of obstruction. Store in a well-ventilated place. Keep container tightly closed. Store locked up. Only allow access to authorized persons. Store and handle in properly designed pressure vessels and equipment. Store and use away from heat, sparks, open flame, or any other ignition source. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Have appropriate extinguishing capability in storage area (e.g. sprinkler system, portable fire extinguishers) and flammable gas detectors. Keep absorbents for leaks and spills readily available. Inspect vents during winter conditions for vapour ice buildup. Storage tanks should be above ground and diked to hold entire contents. Store away from incompatible materials. Store according to applicable regulations and standards for flammable materials.

## 8. Exposure controls/personal protection

### Control Parameters

#### Occupational Exposure Limits

| Chemical Identity | type | Exposure Limit Values |             | Source  |
|-------------------|------|-----------------------|-------------|---|
|                   |      |                       |             |   |
| Cyclohexane       | TWA  | 100 ppm               | 344 mg/m3   | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Cyclohexane       | TWA  | 100 ppm               |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Cyclohexane       | TWA  | 100 ppm               |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Cyclohexane       | TWA  | 300 ppm               | 1,030 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Cyclohexane       | TWA  | 100 ppm               |             | US. ACGIH Threshold Limit Values, as amended  |
| Cyclohexane       | REL  | 300 ppm               | 1,050 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Cyclohexane       | IDLH | 1,300 ppm             |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Hexane            | TWA  | 50 ppm                | 176 mg/m3   | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Hexane            | TWA  | 20 ppm                |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Hexane            | TWA  | 50 ppm                |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Hexane            | TWA  | 50 ppm                | 176 mg/m3   | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Hexane            | TWA  | 50 ppm                |             | US. ACGIH Threshold Limit Values, as amended  |
| Hexane            | REL  | 50 ppm                | 180 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Hexane            | IDLH | 1,100 ppm             |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |

|                      |           |           |             |   |
|----------------------|-----------|-----------|-------------|---|
| Cyclopentane         | TWA       | 600 ppm   | 1,720 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Cyclopentane         | TWA       | 600 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Cyclopentane         | TWA       | 600 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Cyclopentane         | TWA       | 600 ppm   | 1,720 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Cyclopentane         | TWA       | 600 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Cyclopentane         | REL       | 600 ppm   | 1,720 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Pentane, 2-methyl-   | STEL      | 1,000 ppm | 3,500 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                      | TWA       | 500 ppm   | 1,760 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Pentane, 2-methyl-   | TWA       | 200 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Pentane, 2-methyl-   | TWA       | 500 ppm   | 1,760 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
|                      | STEL      | 1,000 ppm | 3,500 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Pentane, 2-methyl-   | STEL      | 1,000 ppm |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                      | TWA       | 500 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Pentane, 2-methyl-   | STEL      | 1,000 ppm |             | US. ACGIH Threshold Limit Values, as amended  |
|                      | TWA       | 500 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Pentane, 2-methyl-   | Ceil_Time | 510 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Pentane, 2-methyl-   | REL       | 100 ppm   | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Octane               | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Octane               | TWA       | 300 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Octane               | TWA       | 300 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Octane               | TWA       | 300 ppm   |             | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Octane               | TWA       | 300 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Octane               | Ceil_Time | 385 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Octane               | REL       | 75 ppm    | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Octane               | IDLH      | 1,000 ppm |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Cyclohexane, methyl- | TWA       | 400 ppm   | 1,610 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Cyclohexane, methyl- | TWA       | 400 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Cyclohexane, methyl- | TWA       | 400 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |

|                      |           |           |             |   |
|----------------------|-----------|-----------|-------------|---|
| Cyclohexane, methyl- | TWA       | 400 ppm   | 1,610 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Cyclohexane, methyl- | TWA       | 400 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Cyclohexane, methyl- | REL       | 400 ppm   | 1,600 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Cyclohexane, methyl- | IDLH      | 1,200 ppm |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| n-Pentane            | TWA       | 600 ppm   | 1,770 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| n-Pentane            | TWA       | 1,000 ppm |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| n-Pentane            | TWA       | 1,000 ppm |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| n-Pentane            | TWA       | 1,000 ppm |             | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| n-Pentane            | TWA       | 1,000 ppm |             | US. ACGIH Threshold Limit Values, as amended  |
| n-Pentane            | REL       | 120 ppm   | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| n-Pentane            | Ceil_Time | 610 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| n-Pentane            | IDLH      | 1,500 ppm |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Heptane, 3-methyl-   | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Heptane, 3-methyl-   | TWA       | 300 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Heptane, 3-methyl-   | STEL      | 375 ppm   | 1,750 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
|                      | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Heptane, 3-methyl-   | TWA       | 300 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Heptane, 3-methyl-   | TWA       | 300 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Heptane, 3-methyl-   | Ceil_Time | 385 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Heptane, 3-methyl-   | REL       | 75 ppm    | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Heptane, 3-methyl-   | IDLH      | 1,000 ppm |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Pentane, 3-methyl-   | STEL      | 1,000 ppm | 3,500 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                      | TWA       | 500 ppm   | 1,760 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Pentane, 3-methyl-   | TWA       | 200 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Pentane, 3-methyl-   | TWA       | 500 ppm   | 1,760 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
|                      | STEL      | 1,000 ppm | 3,500 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Pentane, 3-methyl-   | STEL      | 1,000 ppm |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                      | TWA       | 500 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |



|                        |           |           |             |   |
|------------------------|-----------|-----------|-------------|---|
| Pentane, 3-methyl-     | TWA       | 500 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
|                        | STEL      | 1,000 ppm |             | US. ACGIH Threshold Limit Values, as amended  |
| Pentane, 3-methyl-     | REL       | 100 ppm   | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Pentane, 3-methyl-     | Ceil_Time | 510 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Benzene, ethyl-        | STEL      | 125 ppm   | 543 mg/m3   | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                        | TWA       | 100 ppm   | 434 mg/m3   | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Benzene, ethyl-        | TWA       | 20 ppm    |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Benzene, ethyl-        | TWA       | 20 ppm    |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Benzene, ethyl-        | TWA       | 20 ppm    |             | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Benzene, ethyl-        | TWA       | 20 ppm    |             | US. ACGIH Threshold Limit Values, as amended  |
| Benzene, ethyl-        | REL       | 100 ppm   | 435 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Benzene, ethyl-        | STEL      | 125 ppm   | 545 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Benzene, ethyl-        | IDLH      | 800 ppm   |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Benzene, dimethyl-     | STEL      | 150 ppm   | 651 mg/m3   | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Benzene, dimethyl-     | TWA       | 100 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                        | STEL      | 150 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                        | TWA       | 100 ppm   | 434 mg/m3   | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Benzene, dimethyl-     | TWA       | 100 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                        | STEL      | 150 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Benzene, dimethyl-     | STEL      | 150 ppm   | 651 mg/m3   | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
|                        | TWA       | 100 ppm   | 434 mg/m3   | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Benzene, dimethyl-     | TWA       | 100 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
|                        | STEL      | 150 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Benzene, dimethyl-     | REL       | 100 ppm   | 435 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Benzene, dimethyl-     | STEL      | 150 ppm   | 655 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Pentane, 2,3-dimethyl- | TWA       | 400 ppm   | 1,640 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                        | STEL      | 500 ppm   | 2,050 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Pentane, 2,3-dimethyl- | STEL      | 500 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |

|                        |      |         |             |   |
|------------------------|------|---------|-------------|---|
|                        | TWA  | 400 ppm |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Pentane, 2,3-dimethyl- | TWA  | 400 ppm |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                        | STEL | 500 ppm |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Pentane, 2,3-dimethyl- | TWA  | 400 ppm |             | US. ACGIH Threshold Limit Values, as amended  |
|                        | STEL | 500 ppm |             | US. ACGIH Threshold Limit Values, as amended  |
| Toluene                | TWA  | 50 ppm  | 188 mg/m3   | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Toluene                | TWA  | 20 ppm  |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Toluene                | TWA  | 20 ppm  |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Toluene                | TWA  | 50 ppm  | 188 mg/m3   | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Toluene                | TWA  | 20 ppm  |             | US. ACGIH Threshold Limit Values, as amended  |
| Toluene                | STEL | 150 ppm | 560 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Toluene                | REL  | 100 ppm | 375 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Toluene                | IDLH | 500 ppm |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Hexane, 2-methyl-      | TWA  | 400 ppm | 1,640 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                        | STEL | 500 ppm | 2,050 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Hexane, 2-methyl-      | STEL | 500 ppm |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                        | TWA  | 400 ppm |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Hexane, 2-methyl-      | STEL | 500 ppm |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                        | TWA  | 400 ppm |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Hexane, 2-methyl-      | STEL | 500 ppm |             | US. ACGIH Threshold Limit Values, as amended  |
|                        | TWA  | 400 ppm |             | US. ACGIH Threshold Limit Values, as amended  |
| Benzene                | STEL | 2.5 ppm | 8 mg/m3     | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                        | TWA  | 0.5 ppm | 1.6 mg/m3   | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Benzene                | STEL | 2.5 ppm |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                        | TWA  | 0.5 ppm |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Benzene                | STEL | 2.5 ppm |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                        | TWA  | 0.5 ppm |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |

|                |           |           |             |   |
|----------------|-----------|-----------|-------------|---|
| Benzene        | TWA       | 1 ppm     | 3 mg/m3     | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
|                | STEL      | 5 ppm     | 15.5 mg/m3  | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Benzene        | STEL      | 2.5 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
|                | TWA       | 0.5 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Benzene        | REL       | 0.1 ppm   |             | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Benzene        | STEL      | 1 ppm     |             | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Benzene        | IDLH      | 500 ppm   |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Heptane        | TWA       | 400 ppm   | 1,640 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                | STEL      | 500 ppm   | 2,050 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Heptane        | STEL      | 500 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                | TWA       | 400 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Heptane        | STEL      | 500 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                | TWA       | 400 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Heptane        | STEL      | 500 ppm   |             | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
|                | TWA       | 400 ppm   |             | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Heptane        | TWA       | 400 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
|                | STEL      | 500 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Heptane        | REL       | 85 ppm    | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Heptane        | Ceil_Time | 440 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Heptane        | IDLH      | 750 ppm   |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Nonane         | TWA       | 200 ppm   | 1,050 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Nonane         | TWA       | 200 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Nonane         | TWA       | 200 ppm   | 1,050 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Nonane         | TWA       | 200 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Nonane         | TWA       | 200 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Nonane         | REL       | 200 ppm   | 1,050 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| 2-Methylbutane | TWA       | 600 ppm   | 1,770 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| 2-Methylbutane | TWA       | 1,000 ppm |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |

|                            |      |           |                         |   |
|----------------------------|------|-----------|-------------------------|---|
| 2-Methylbutane             | TWA  | 1,000 ppm |                         | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| 2-Methylbutane             | TWA  | 1,000 ppm |                         | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| 2-Methylbutane             | TWA  | 1,000 ppm |                         | US. ACGIH Threshold Limit Values, as amended  |
| Pentane, 2,4-dimethyl-     | STEL | 500 ppm   | 2,050 mg/m <sup>3</sup> | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                            | TWA  | 400 ppm   | 1,640 mg/m <sup>3</sup> | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Pentane, 2,4-dimethyl-     | STEL | 500 ppm   |                         | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                            | TWA  | 400 ppm   |                         | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Pentane, 2,4-dimethyl-     | TWA  | 400 ppm   |                         | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                            | STEL | 500 ppm   |                         | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Pentane, 2,4-dimethyl-     | STEL | 500 ppm   |                         | US. ACGIH Threshold Limit Values, as amended  |
|                            | TWA  | 400 ppm   |                         | US. ACGIH Threshold Limit Values, as amended  |
| 2,2,3,4-Tetramethylpentane | TWA  | 200 ppm   | 1,050 mg/m <sup>3</sup> | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| 2,2,3,4-Tetramethylpentane | TWA  | 200 ppm   |                         | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| 2,2,3,4-Tetramethylpentane | TWA  | 200 ppm   | 1,050 mg/m <sup>3</sup> | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| 2,2,3,4-Tetramethylpentane | TWA  | 200 ppm   |                         | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| 2,2,3,4-Tetramethylpentane | TWA  | 200 ppm   |                         | US. ACGIH Threshold Limit Values, as amended  |
| 2,2,3,4-Tetramethylpentane | REL  | 200 ppm   | 1,050 mg/m <sup>3</sup> | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| 2,2-Dimethylpentane        | TWA  | 400 ppm   | 1,640 mg/m <sup>3</sup> | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                            | STEL | 500 ppm   | 2,050 mg/m <sup>3</sup> | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| 2,2-Dimethylpentane        | TWA  | 400 ppm   |                         | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                            | STEL | 500 ppm   |                         | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| 2,2-Dimethylpentane        | STEL | 500 ppm   |                         | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                            | TWA  | 400 ppm   |                         | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| 2,2-Dimethylpentane        | STEL | 500 ppm   |                         | US. ACGIH Threshold Limit Values, as amended  |
|                            | TWA  | 400 ppm   |                         | US. ACGIH Threshold Limit Values, as amended  |
| 3,3-Dimethylhexane         | TWA  | 300 ppm   | 1,400 mg/m <sup>3</sup> | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| 3,3-Dimethylhexane         | TWA  | 300 ppm   |                         | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |

|                    |           |           |             |   |
|--------------------|-----------|-----------|-------------|---|
| 3,3-Dimethylhexane | TWA       | 300 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| 3,3-Dimethylhexane | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
|                    | STEL      | 375 ppm   | 1,750 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| 3,3-Dimethylhexane | TWA       | 300 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| 3,3-Dimethylhexane | Ceil_Time | 385 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| 3,3-Dimethylhexane | REL       | 75 ppm    | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| 3,3-Dimethylhexane | IDLH      | 1,000 ppm |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Hexane, 3-methyl-  | TWA       | 400 ppm   | 1,640 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                    | STEL      | 500 ppm   | 2,050 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Hexane, 3-methyl-  | TWA       | 400 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                    | STEL      | 500 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Hexane, 3-methyl-  | STEL      | 500 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                    | TWA       | 400 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Hexane, 3-methyl-  | TWA       | 400 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
|                    | STEL      | 500 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Pentane, 3-ethyl-  | TWA       | 400 ppm   | 1,640 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                    | STEL      | 500 ppm   | 2,050 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Pentane, 3-ethyl-  | STEL      | 500 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                    | TWA       | 400 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Pentane, 3-ethyl-  | STEL      | 500 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                    | TWA       | 400 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Pentane, 3-ethyl-  | TWA       | 400 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
|                    | STEL      | 500 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| 2-Methylheptane    | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| 2-Methylheptane    | TWA       | 300 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| 2-Methylheptane    | TWA       | 300 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| 2-Methylheptane    | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |

|                       |           |           |             |   |
|-----------------------|-----------|-----------|-------------|---|
|                       | STEL      | 375 ppm   | 1,750 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| 2-Methylheptane       | TWA       | 300 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| 2-Methylheptane       | REL       | 75 ppm    | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| 2-Methylheptane       | Ceil_Time | 385 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| 2-Methylheptane       | IDLH      | 1,000 ppm |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Hexane, 3,4-dimethyl- | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Hexane, 3,4-dimethyl- | TWA       | 300 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Hexane, 3,4-dimethyl- | STEL      | 375 ppm   | 1,750 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
|                       | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Hexane, 3,4-dimethyl- | TWA       | 300 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Hexane, 3,4-dimethyl- | TWA       | 300 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Hexane, 3,4-dimethyl- | Ceil_Time | 385 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Hexane, 3,4-dimethyl- | REL       | 75 ppm    | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Hexane, 3,4-dimethyl- | IDLH      | 1,000 ppm |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |
| Hexane, 3-ethyl-      | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
| Hexane, 3-ethyl-      | TWA       | 300 ppm   |             | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
| Hexane, 3-ethyl-      | TWA       | 300 ppm   |             | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
| Hexane, 3-ethyl-      | STEL      | 375 ppm   | 1,750 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
|                       | TWA       | 300 ppm   | 1,400 mg/m3 | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Hexane, 3-ethyl-      | TWA       | 300 ppm   |             | US. ACGIH Threshold Limit Values, as amended  |
| Hexane, 3-ethyl-      | REL       | 75 ppm    | 350 mg/m3   | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Hexane, 3-ethyl-      | Ceil_Time | 385 ppm   | 1,800 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards, as amended   |
| Hexane, 3-ethyl-      | IDLH      | 1,000 ppm |             | US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended  |

### Biological Limit Values

| Chemical Identity   | Exposure Limit Values          | Source    |
|---|--------------------------------|-----------|
| Hexane (2,5-Hexanedion, without hydrolysis: Sampling time: End of shift.)                     | 0.5 mg/l (Urine)               | ACGIH BEI |
| Benzene, ethyl- (Sum of mandelic acid and phenylglyoxylic acid: Sampling time: End of shift.) | 0.15 g/g (Creatinine in urine) | ACGIH BEI |
| Benzene, dimethyl- (Methylhippuric acids: Sampling time: End of shift.)                       | 1.5 g/g (Creatinine in urine)  | ACGIH BEI |

|   |                                |           |
|---|--------------------------------|-----------|
| Toluene (toluene: Sampling time: Prior to last shift of work week.) | 0.02 mg/l (Blood)              | ACGIH BEI |
| Toluene (o-Cresol, with hydrolysis: Sampling time: End of shift.)   | 0.3 mg/g (Creatinine in urine) | ACGIH BEI |
| Toluene (toluene: Sampling time: End of shift.)                     | 0.03 mg/l (Urine)              | ACGIH BEI |
| Benzene (S-Phenylmercapturic acid: Sampling time: End of shift.)    | 25 µg/g (Creatinine in urine)  | ACGIH BEI |
| Benzene (t,t-Muconic acid: Sampling time: End of shift.)            | 500 µg/g (Creatinine in urine) | ACGIH BEI |

### Exposure guidelines

| Chemical Identity | Notations                         | Source  |
|-------------------|-----------------------------------|---|
| Hexane            | Can be absorbed through the skin. | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                   | Can be absorbed through the skin. | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                   | Can be absorbed through the skin. | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |
|                   | Can be absorbed through the skin. | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Toluene           | Can be absorbed through the skin. | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                   | Can be absorbed through the skin. | Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended   |
| Benzene           | Can be absorbed through the skin. | Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended   |
|                   | Can be absorbed through the skin. | Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) |
|                   | Can be absorbed through the skin. | Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended  |

### Appropriate Engineering Controls

Engineering methods to reduce hazardous exposure are preferred controls. Methods include mechanical ventilation (dilution and local exhaust) process or personal enclosure, remote and automated operation, control of process conditions, leak detection and repair systems, and other process modifications. Ensure all exhaust ventilation systems are discharged to outdoors, away from air intakes and ignition sources. Supply sufficient replacement air to make up for air removed by exhaust systems. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Administrative (procedure) controls and use of personal protective equipment may also be required.

### Individual protection measures, such as personal protective equipment

#### General information:

Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

#### Eye/face protection:

Safety glasses. Chemical goggles are recommended if splashing is possible or to prevent eye irritation from vapours.

**Skin Protection****Hand Protection:** Chemical resistant gloves.**Skin and Body Protection:**

Wear appropriate clothing to prevent any possibility of skin contact. Wear work clothes with long sleeves and pants. If splashing or contact with liquid material is possible, consider the need for an impervious overcoat. Fire resistant (i.e., Nomex) or natural fibre clothing (i.e., cotton or wool) is recommended. Synthetic clothing can generate static electricity and is not recommended where a flammable vapour release may occur. Wear chemical-resistant safety footwear with good traction to prevent slipping. Static Dissipative (SD) rated footwear is also recommended.

**Respiratory Protection:**

Appropriate NIOSH approved air-purifying respirator that meets the requirements of CSA Standard CAN/CSA-Z94.4, or self-contained breathing apparatus should be used. Air supplied breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.

**Hygiene measures:**

Use effective control measures and PPE to maintain worker exposure to concentrations that are below these limits. Ensure that eyewash stations and safety showers are in close proximity to work locations.

**9. Physical and chemical properties****Appearance**

|  |   |
|--|---|
| <b>Physical state:</b>                                       | liquid  |
| <b>Form:</b>   | liquid  |
| <b>Colour:</b>   | Colourless  |
| <b>Odour:</b>  | sweet aromatic  |
| <b>Odour Threshold:</b>                                      | No data available.  |
| <b>pH:</b>   | not applicable  |
| <b>Melting point/freezing point:</b>                         | -160 °C (-256 °F) (estimated)                                   |
| <b>Initial boiling point and boiling range:</b>              | 40 - 190 °C (104 - 374 °F)                                      |
| <b>Flash Point:</b>  | < -18 °C (< -0.40 °F) (Closed cup)                              |
| <b>Evaporation rate:</b>                                     | 5.6   |
| <b>Flammability (solid, gas):</b>                            | not applicable  |
| <b>Upper/lower limit on flammability or explosive limits</b> |   |
| <b>Flammability limit - upper (%):</b>                       | No data available.  |
| <b>Flammability limit - lower(%):</b>                        | No data available.  |
| <b>Vapour pressure:</b>                                      | 27 - 43 kPa (37.8 °C (100.0 °F)) (Reid Vapour Pressure)         |
| <b>Vapour density:</b>                                       | 3 (Air=1) (ambient conditions)                                  |
| <b>Density:</b>  | 720 - 780 kg/m <sup>3</sup>                                     |
| <b>Relative density:</b>                                     | 0.72 - 0.78 (Water=1)   |
| <b>Solubility(ies)</b>                                       |   |
| <b>Solubility in water:</b>                                  | Insoluble in water  |
| <b>Solubility (other):</b>                                   | Highly soluble in ether, alcohols and other aliphatic solvents. |
| <b>Partition coefficient (n-octanol/water):</b>              | 2.2 - 4.5 (similar mixtures)                                    |
| <b>Auto-ignition temperature:</b>                            | 254 °C (489 °F)   |
| <b>Decomposition temperature:</b>                            | No data available.  |
| <b>Viscosity:</b>  | 2 mm <sup>2</sup> /s (40 °C (104 °F)), estimated                |

**10. Stability and reactivity**

**Reactivity:** Contact with incompatible materials. Sources of ignition. Exposure to heat.



|  |  |
|--|--|
| <b>Chemical Stability:</b>                 | Stable under normal storage conditions. Some components of the product become unstable at elevated temperatures and pressures. |
| <b>Possibility of Hazardous Reactions:</b> | No data available.   |
| <b>Conditions to Avoid:</b>                | Contact with incompatible materials. Sources of ignition. Exposure to heat.  |
| <b>Incompatible Materials:</b>             | Oxidizers. Presence of strong oxidizers can increase fire and explosion hazard.  |
| <b>Hazardous Decomposition Products:</b>   | Upon decomposition, this product emits carbon monoxide, carbon dioxide, low molecular weight hydrocarbons.                     |

## 11. Toxicological information

### Information on likely routes of exposure

|                      |   |
|----------------------|---|
| <b>Inhalation:</b>   | Inhalation of this product causes headache, dizziness and nausea and loss of coordination. Repeated inhalation may result in bronchitis or other breathing problems, possible damage to the peripheral nervous systems and possible cardiac sensitization. Minute amounts aspirated into the lungs during ingestion or vomiting may cause pulmonary injury. |
| <b>Ingestion:</b>    | Harmful if swallowed. Minute amounts aspirated into the lungs during ingestion or vomiting may cause severe pulmonary injury. Ingestion of this product may result in vomiting, nausea, abdominal pain and central nervous system effects including headache, sleepiness, dizziness and nausea. Ingestion may also cause blood disorders.                   |
| <b>Skin Contact:</b> | Causes skin irritation.   |
| <b>Eye contact:</b>  | Causes serious eye irritation.  |

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

|                      |   |
|----------------------|---|
| <b>Inhalation:</b>   | Central nervous system (hearing effect). Respiratory irritation.                        |
| <b>Ingestion:</b>    | Vomiting, nausea, abdominal pain and central nervous system effects including headache. |
| <b>Skin Contact:</b> | Skin irritation.  |
| <b>Eye contact:</b>  | Eye irritation.   |

### Information on toxicological effects

#### Acute toxicity (list all possible routes of exposure)

|                            |  |
|----------------------------|--|
| <b>Oral Product:</b>       | ATEmix: 1,074.33 mg/kg                                     |
| <b>Dermal Product:</b>     | Not classified for acute toxicity based on available data. |
| <b>Inhalation Product:</b> | Not classified for acute toxicity based on available data. |

|  |                    |
|--|--------------------|
| <b>Repeated dose toxicity Product:</b> | No data available. |
|--|--------------------|

**Components:**

Benzene  
LOAEL (Rat, Oral): 25 mg/kg (Target Organ(s): Blood)  
LOAEL (Rat, Inhalation - vapour): 0.958 mg/l (Target Organ(s): Blood)  
LOAEL (Human, Inhalation - vapour): 0.0018 mg/l (Target Organ(s): Blood)

**Skin Corrosion/Irritation**

**Product:** Causes skin irritation.

**Serious Eye Damage/Eye Irritation**

**Product:** Causes serious eye irritation.

**Respiratory or Skin Sensitization**

**Product:** No data available.

**Carcinogenicity**

**Product:** May cause cancer.

**IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:**

Benzene, ethyl- Overall evaluation: 2B. Possibly carcinogenic to humans.  
Benzene Overall evaluation: 1. Carcinogenic to humans.

**US. National Toxicology Program (NTP) Report on Carcinogens:**

Benzene Known To Be Human Carcinogen.

**ACGIH Carcinogen List:**

Benzene, ethyl- Group A3: Confirmed animal carcinogen with unknown relevance to humans.  
Benzene Group A1: Confirmed human carcinogen.

**Germ Cell Mutagenicity****In vitro**

**Product:** May cause genetic defects.

**In vivo**

**Product:** May cause genetic defects.

**Reproductive toxicity**

**Product:** Suspected of damaging fertility or the unborn child.

**Specific Target Organ Toxicity - Single Exposure**

**Product:** May cause respiratory irritation. May cause drowsiness or dizziness.

**Specific Target Organ Toxicity - Repeated Exposure**

**Product:** Blood - Causes damage to organs through prolonged or repeated exposure.  
Nervous system, hearing organs, Central nervous system - May cause damage to organs through prolonged or repeated exposure.

**Aspiration Hazard**

**Product:** May be fatal if swallowed and enters airways.

**Other effects:**

Xylene is a developmental toxicant in Canada.

**12. Ecological information****Ecotoxicity:****Acute hazards to the aquatic environment:****Fish**

**Product:** Very toxic to aquatic life.

**Aquatic Invertebrates****Product:** Very toxic to aquatic life.**Toxicity to aquatic plants****Product:** Very toxic to aquatic life.**Chronic hazards to the aquatic environment:****Fish****Product:** Very toxic to aquatic life with long lasting effects.**Aquatic Invertebrates****Product:** Very toxic to aquatic life with long lasting effects.**Toxicity to aquatic plants****Product:** Very toxic to aquatic life with long lasting effects.**Persistence and Degradability****Biodegradation****Product:** No data available.**BOD/COD Ratio****Product:** No data available.**Bioaccumulative Potential****Bioconcentration Factor (BCF)****Product:** No data available.**Partition Coefficient n-octanol / water (log Kow)****Product:** 2.2 - 4.5 (similar mixtures)**Mobility in Soil:**

When released into the environment, this product is expected to partition primarily to air (&gt; 95%), with some partitioning to water (&lt; 3%), to soils (&lt; 2%) and into sediment (&lt; 1%). Spill remediation has shown potential for downward movement and partitioning into groundwater.

**Other Adverse Effects:**

No data available.

**13. Disposal considerations****Disposal instructions:**

Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. Waste generator is advised to carefully consider hazardous properties and control measures needed for other materials that may be found in the waste.

**Contaminated Packaging:**

Check local, federal and provincial environmental regulations prior to disposal.

**14. Transport information****TDG**

|                               |  |
|-------------------------------|--|
| UN number or ID number:       | UN 1268  |
| UN Proper Shipping Name:      | PETROLEUM DISTILLATES, N.O.S.                                    |
| Class                         | 3  |
| Packing Group                 | II   |
| Label(s)                      | 3  |
| Subsidiary risk label         | —  |
| Special precautions for user: | Reference Emergency Response Guidebook No. 128, latest revision. |

**IMDG**

|                               |   |
|-------------------------------|---|
| UN number or ID number:       | UN 1268   |
| UN Proper Shipping Name:      | PETROLEUM DISTILLATES, N.O.S.   |
| Transport Hazard Class(es)    |   |
| Class:                        | 3   |
| Label(s):                     | 3   |
| EmS No.:                      | F-E, S-E  |
| Packing Group:                | II  |
| Marine pollutant:             | Yes   |
| Limited quantity              | 1.00L   |
| Excepted quantity             | E2  |
| Special precautions for user: | Transport in bulk according to Annex I of MARPOL 73/78 and the IBC Code: Annex I - yes; IBC02 |

**15. Regulatory information****Canada Federal Regulations****List of Toxic Substances (CEPA, Schedule 1)****Chemical Identity**

Benzene

**Export Control List (CEPA 1999, Schedule 3)**

Not regulated

**National Pollutant Release Inventory (NPRI)****Canada. Canadian Environmental Protection Act (CEPA). National Pollutant Release Inventory (NPRI) (Parts 1-4)**

|      |                      |
|------|----------------------|
| NPRI | Cyclohexane          |
|      | Hexane               |
|      | Octane               |
|      | Cyclohexane, methyl- |
|      | n-Pentane            |
|      | Benzene, ethyl-      |
|      | Benzene, dimethyl-   |
|      | Toluene              |
|      | Benzene              |
|      | Heptane              |
|      | 2-Methylbutane       |
|      | n-Butane             |

**Canada. National Pollutant Release Inventory (NPRI) Substances, Part 5, VOCs with Additional Reporting Requirements**

|          |                            |
|----------|----------------------------|
| NPRI PT5 | Cyclopentane, methyl-      |
|          | Hexane                     |
|          | Pentane, 2-methyl-         |
|          | Octane                     |
|          | n-Pentane                  |
|          | Heptane, 3-methyl-         |
|          | Pentane, 3-methyl-         |
|          | 3,5-Dimethyloctane         |
|          | Benzene, dimethyl-         |
|          | Pentane, 2,3-dimethyl-     |
|          | Toluene                    |
|          | Hexane, 2-methyl-          |
|          | Benzene                    |
|          | Heptane                    |
|          | Nonane                     |
|          | 2-Methylbutane             |
|          | Pentane, 2,4-dimethyl-     |
|          | 2,2,3,4-Tetramethylpentane |

2,2-Dimethylpentane  
 3,3-Dimethylhexane  
 Nonane, 5-methyl-  
 Pentane, 3-ethyl-  
 2-Methylheptane  
 Decane  
 2,4-Dimethylheptane  
 Hexane, 3,4-dimethyl-  
 2,2-Dimethylheptane  
 2,3-Dimethylheptane  
 Hexane, 3-ethyl-  
 2,3,5-Trimethylhexane  
 4-Methyloctane  
 n-Butane

**Greenhouse Gases**

Not regulated

**Precursor Control Regulations****Chemical Identity**

Toluene

**Canada. Substances Subject to Significant New Activity (SNAc) Reporting Requirements**

Not regulated

**Inventory status**

Canada DSL Inventory List: On or in compliance with the inventory

US TSCA Inventory: On or in compliance with the inventory

**16. Other information, including date of preparation or last revision****Issue Date:** 10/11/2021

**Revision Information:** 10/11/2021: SDS Update – composition edits, OEL updates, section 15 updates, phrase edits  
 04/07/2021: SDS Update – composition edits  
 08/19/2020: SDS Update – composition edits  
 04/23/2020: SDS Update – composition edits, section 9 edits  
 12/11/2019: SDS Update

**Version #:** 7.4

**Abbreviations and acronyms:** ACGIH = American Conference of Governmental Industrial Hygienists; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; CEPA = Canadian Environmental Protection Act; COD = Chemical Oxygen Demand; DSL = Domestic Substances List; EC50 = Effective Concentration 50%; EPA = Environmental Protection Agency; GHS = Globally Harmonized System for the Classification and Labelling of Chemicals; IARC = International Agency for Research on Cancer; IDLH = Immediately Dangerous to Life or Health; Kow = Octanol/water partition coefficient; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; LEL = Lower Explosive Limit; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OEL = Occupational Exposure Limit; OSHA = Occupational Safety and Health Administration; PNOC = Particulates Not Otherwise Classified; PPE = Personal Protective Equipment; REL = Recommended Exposure Limit; SCBA = Self Contained Breathing Apparatus; SDS = Safety Data Sheet; STEL = Short Term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

**Further Information:** For additional information on equipment bonding and grounding, refer to the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity".

For additional information on storing and handling flammable liquids, refer to the National Fire Protection Association (NFPA) 30, "Flammable and Combustible Liquids Code".

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