MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Product identifier	**KLONDIKE Brake Clean**
Version #	02
Issue date	07-16-2014
Revision date	11-10-2014
Supersedes date	07-16-2014
CAS #	Mixture
Product code	Brake Clean
Product use	Brake Parts Cleaner
Manufacturer information	KLONDIKE Lubricants Corporation 3078 275th Street Langley, BC V4W 3L4 Canada info@klondikelubricants.com www.klondikelubricants.com
	General Information 1-877-293-4691 Chemtrec (Within US) 1-800-424-9300 Chemtrec (International) 1-703-527-3887
Supplier	Refer to Manufacturer

2. Hazards Identification

Emergency overview

DANGER
EXTREMELY FLAMMABLE LIQUID AND VAPOR.
May cause moderate to severe eye irritation. May cause mild to moderate skin irritation. May cause respiratory irritation. May cause central nervous system effects. Prolonged or repeated exposure may cause kidney and central nervous system effects. Prolonged or repeated overexposure may cause liver effects.

Potential health effects

Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	May cause moderate to severe eye irritation.
Skin	May cause mild to moderate skin irritation. Skin absorption: May be absorbed through the skin, however there are no reports of harmful effects following occupational exposure.
Inhalation	May cause irritation of respiratory tract. May cause central nervous system effects.
Ingestion	May cause irritation of the gastrointestinal tract. Product may present an aspiration hazard, if ingested in large amounts.
Target organs	Central nervous system. Eyes. Respiratory system. Skin.
Chronic effects	Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. Prolonged or repeated overexposure may cause liver and kidney effects.
Most important symptoms/effects, acute and delayed	May cause moderate to severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause mild to moderate skin irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin. May cause respiratory irritation. Symptoms may include upper respiratory irritation, coughing, and breathing difficulties. May cause central nervous system effects. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Product may present an aspiration hazard, if ingested in large amounts. Aspiration into the lungs during swallowing or subsequent vomiting may cause chemical pneumonitis, which can be fatal.
Potential environmental effects	May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
N-hexane	110-54-3	45 - 55

Components	CAS #	Percent
Heptane (N-heptane)	142-82-5	45 - 50
Isopropanol	67-63-0	3 - 7

4. First Aid Measures

First aid procedures

Inhalation Move to fresh air. If breathing stops, provide artificial respiration.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before reuse.

Eye contact Rinse immediately with plenty of water for at least 15 minutes.

Ingestion Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Never give anything by mouth to a victim who is unconscious or is having convulsions. Get medical attention.

Notes to physician Symptoms may be delayed.

General advice If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties Flammable by WHMIS criteria. Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. Material will float on water and can be re-ignited at the water's surface.

Extinguishing media

Suitable extinguishing media Powder. Foam. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Protection of firefighters

Protective equipment for firefighters Firefighters should wear full protective clothing including self contained breathing apparatus.

Fire fighting equipment/instructions Firefighters should wear full protective gear. Cool containers exposed to heat with water spray and remove container, if no risk is involved. Prevent fire extinguishing water from contaminating surface water or the ground water system.

Specific methods Cool containers exposed to flames with water until well after the fire is out.

Explosion data

Sensitivity to static discharge May be sensitive to static discharge. Vapours in the flammable range may be ignited by a static discharge or sufficient energy.

Sensitivity to mechanical impact Not expected to be sensitive to mechanical impact.

Hazardous combustion products Carbon oxides. Other irritating fumes and smoke.

6. Accidental Release Measures

Personal precautions Consider initial downwind evacuation for at least 500 meters (1/3 mile). Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Avoid inhalation of vapors and spray mists. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. For personal protection, see section 8 of the MSDS.

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not contaminate water.

Methods and materials for containment and cleaning up

Extinguish all flames in the vicinity. This product is miscible in water.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent entry into waterways, sewer, basements or confined areas.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the MSDS. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

Other information

Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling

Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Minimize fire risks from flammable and combustible materials (including combustible dust and static accumulating liquids) or dangerous reactions with incompatible materials. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. All equipment used when handling the product must be grounded. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. When using, do not eat, drink or smoke. Use only in area provided with appropriate exhaust ventilation. Wear appropriate personal protective equipment. Wash thoroughly after handling. Avoid release to the environment.

For additional information on equipment bonding and grounding, refer to the Canadian Electrical Code in Canada, (CSA C22.1), or 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" or National Fire Protection Association (NFPA) 70, "National Electrical Code".

Storage

This material can accumulate static charge which may cause spark and become an ignition source. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in tightly closed original container in a dry, cool and well-ventilated place. Store away from incompatible materials (see Section 10 of the MSDS). Keep out of the reach of children. Keep in an area equipped with sprinklers. Use care in handling/storage.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value
Heptane (N-heptane) (CAS 142-82-5)	STEL	500 ppm
	TWA	400 ppm
Isopropanol (CAS 67-63-0)	STEL	400 ppm
	TWA	200 ppm
N-hexane (CAS 110-54-3)	TWA	50 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Heptane (N-heptane) (CAS 142-82-5)	PEL	2000 mg/m3
		500 ppm
Isopropanol (CAS 67-63-0)	PEL	980 mg/m3
		400 ppm
N-hexane (CAS 110-54-3)	PEL	1800 mg/m3
		500 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Isopropanol (CAS 67-63-0)	40 mg/l	Acetone	Urine	*

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
N-hexane (CAS 110-54-3)	0.4 mg/l	2,5-Hexanedion, without hydrolysis	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines

Canada - Alberta OELs: Skin designation

N-hexane (CAS 110-54-3) Can be absorbed through the skin.

Canada - British Columbia OELs: Skin designation

N-hexane (CAS 110-54-3) Can be absorbed through the skin.

Canada - Manitoba OELs: Skin designation

N-hexane (CAS 110-54-3) Can be absorbed through the skin.

Canada - Ontario OELs: Skin designation

N-hexane (CAS 110-54-3) Can be absorbed through the skin.

Canada - Quebec OELs: Skin designation

N-hexane (CAS 110-54-3) Can be absorbed through the skin.

Canada - Saskatchewan OELs: Skin designation

N-hexane (CAS 110-54-3) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

N-hexane (CAS 110-54-3) Can be absorbed through the skin.

Engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Eye/face protection Wear safety goggles or glasses as appropriate for the job. A full face shield may also be necessary. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin protection Wear chemical protective equipment that is specifically recommended by the manufacturer. It may provide little or no thermal protection.

Respiratory protection Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Advice should be sought from respiratory protection specialists.

Hand protection Wear appropriate chemical resistant gloves. Advice should be sought from glove suppliers.

9. Physical & Chemical Properties

Appearance

Physical state	Liquid.
Form	Liquid.
Color	Clear.
Odor	Alcohol-like.
Odor threshold	Not available.
pH	Not available.
Vapor pressure	134.4 hPa
Vapor density	2.5
Boiling point	Not available.
Melting point/Freezing point	Not available.
Solubility (water)	Soluble
Specific gravity	0.69
Relative density	Not available.
Flash point	-23.0 °C (-9.4 °F)
Flammability limits in air, upper, % by volume	Not available.

Flammability limits in air, lower, % by volume	Not available.
Auto-ignition temperature	Not available.
Evaporation rate	Not available.
Percent volatile	100 %
Partition coefficient (n-octanol/water)	Not available.

10. Chemical Stability & Reactivity Information

Chemical stability	Risk of explosion.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Contact with incompatible materials. Do not use in areas without adequate ventilation.
Incompatible materials	Strong oxidizing agents. Strong acids. Alkali metals.
Hazardous decomposition products	None known, refer to hazardous combustion products in Section 5.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Product	Species	Test Results
KLONDIKE Brake Clean (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	3527.85 mg/kg
Inhalation		
LC50	Rat	28914 ppm, 4 hours (Vapor)
Oral		
LD50	Rat	16247 mg/kg
Components	**Species**	**Test Results**
Heptane (N-heptane) (CAS 142-82-5)		
Acute		
Dermal		
LD50	Rabbit	3400 mg/kg
Inhalation		
LC50	Rat	102.5 mg/l, 4 hours
Oral		
LD50	Rat	> 15000 mg/kg
Isopropanol (CAS 67-63-0)		
Acute		
Dermal		
LD50	Rabbit	12890 mg/kg
Inhalation		
LC50	Rat	17000 ppm, 4 hours (vapor) 41.8 mg/l, 4 hours (vapor)
Oral		
LD50	Rat	4720 mg/kg
N-hexane (CAS 110-54-3)		
Acute		
Dermal		
LD50	Rabbit	> 3295 mg/kg
Inhalation		
LC50	Rat	38500 ppm, 4 hours

Components	Species	Test Results
Oral		
LD50	Rat	28710 mg/kg

Acute effects May cause mild to moderate skin irritation. May cause moderate to severe eye irritation. May cause respiratory irritation. May cause central nervous system effects. May cause irritation of the gastrointestinal tract.

Sensitization Not expected to be a respiratory sensitizer. Not expected to be a skin sensitizer.

Chronic effects Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. Prolonged exposure may cause CNS (central nervous system) effects including dizziness, drowsiness and incoordination. Prolonged or repeated overexposure may cause liver and kidney effects.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

ACGIH Carcinogens

Isopropanol (CAS 67-63-0) A4 Not classifiable as a human carcinogen.

Skin corrosion/irritation May cause mild to moderate skin irritation.

Serious eye damage/irritation May cause moderate to severe eye irritation.

Mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Reproductive effects This product is not expected to cause reproductive or developmental effects.

Teratogenicity This product is not expected to be a teratogen. This product contains Isopropanol. Isopropanol is no longer considered a developmental toxin. Tertaogenic / fetotoxic effects were observed in animals, however the effects were observed in the presence of maternal toxicity or at concentrations where maternal toxicity may occur.

Most important symptoms/effects, acute and delayed May cause moderate to severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause mild to moderate skin irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin. May cause respiratory irritation. Symptoms may include upper respiratory irritation, coughing, and breathing difficulties. May cause central nervous system effects. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Product may present an aspiration hazard, if ingested in large amounts. Aspiration into the lungs during swallowing or subsequent vomiting may cause chemical pneumonitis, which can be fatal.

Synergistic materials None known.

12. Ecological Information

Ecotoxicological data

Product		Species	Test Results
KLONDIKE Brake Clean (CAS Mixture)			
Aquatic			
Acute			
Crustacea	EC50	Daphnia	2.3038 mg/l, 48 Hours estimated
Fish	LC50	Fish	5.1249 mg/l, 96 hours estimated
Components		**Species**	**Test Results**
Heptane (N-heptane) (CAS 142-82-5)			
Acute			
	LC50	Rainbow trout (Oncorhynchus mykiss)	5.738 mg/l, 96 hours (QSAR Estimation)
Aquatic			
Acute			
Algae	EC50	Algae	4.338 mg/l, 72 Hours (QSAR Estimation)
Crustacea	EC50	Water flea (Daphnia magna)	1.5 mg/l, 48 Hours
Isopropanol (CAS 67-63-0)			
Aquatic			
Acute			
Crustacea	EC50	Water flea (Daphnia magna)	1400 mg/l, 48 hours

Components		Species	Test Results
Fish	LC50	Fathead minnow (Pimephales promelas)	9640 mg/l, 96 hours
Chronic			
Crustacea	NOEC	Water flea (Daphnia magna)	30 mg/l, 21 days
N-hexane (CAS 110-54-3)			
Chronic			
	NOEC	Rainbow trout (Oncorhynchus mykiss)	2.8 mg/l, 28 days
Aquatic			
Acute			
Algae	EC50	Green algae (Selenastrum capricornutum)	0.89 mg/l, 96 hours
Crustacea	EC50	Water flea (Daphnia magna)	3.9 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	2.5 mg/l, 96 hours
Chronic			
Crustacea	NOEC	Water flea (Daphnia magna)	4.9 mg/l, 21 days

Ecotoxicity Contains a substance which causes risk of hazardous effects to the environment. See above for individual ingredient ecotoxicity data.

Environmental effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Aquatic toxicity May cause long-term adverse effects in the aquatic environment.

Persistence and degradability Contains the following chemicals which are considered to be readily biodegradable: Heptane. Isopropyl alcohol. Hexane.

Bioaccumulation / accumulation

Bioaccumulative potential

Bioconcentration factor	
Isopropanol	1

Partition coefficient

Heptane (N-heptane)	4.66
Isopropanol	0.05
N-hexane	3.9

Mobility in environmental media This product is miscible in water.

13. Disposal Considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport Information

TDG

UN number	UN1993
UN proper shipping name	Flammable liquids, n.o.s. (N-hexane; Heptane (N-heptane))
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	Yes
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

IATA

UN number	UN1993

UN proper shipping name	Flammable liquids, n.o.s. (N-hexane; Heptane (N-heptane))
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Environmental hazards	Yes
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Forbidden.
Cargo aircraft only	Forbidden.

IMDG

UN number	UN1993
UN proper shipping name	Flammable liquids, n.o.s. (N-hexane; Heptane (N-heptane))
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Environmental hazards	
Marine pollutant	Yes
EmS	Not available.
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

IATA; IMDG; TDG

Marine pollutant

General information	IMDG Regulated Marine Pollutant.

15. Regulatory Information

Canadian regulations	This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.
WHMIS status	Controlled
WHMIS classification	B2 - Flammable Liquids D2A - Other Toxic Effects-VERY TOXIC D2B - Other Toxic Effects-TOXIC

WHMIS labeling

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other Information

HMIS® ratings

Health: 2*
Flammability: 3
Physical hazard: 0

NFPA ratings

Health: 2
Flammability: 3
Instability: 0

Disclaimer

The information in this document was written based on the best knowledge and experience currently available, and is offered for your consideration and guidance when exposed to this product. KLONDIKE Lubricants Corporation disclaim all expressed or implied warranties and assume no responsibilities for the accuracy or completeness of the data contained herein. The data in this document does not apply to use with any other product or in any other process. This document may not be changed, or altered in any way without the expressed knowledge and permission of KLONDIKE Lubricants Corporation.

Bibliography

Not available.

Legend to abbreviations and acronyms used in the SDS

Not available.