MATERIAL SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

Product identifier : **LEAD SUBSTITUTE**

Product Use : Fuel additive
Chemical Family : Mixture.
Manufacturer part no. : M5012C

Supplier's name and address:

Radiator Specialty Co., of Canada
1711 Aimco Blvd.
Mississauga, ON, Canada
L4W 1H7

Manufacturer's name and address:
Refer to Supplier

Information Telephone # : (905) 625-9117 (Monday - Friday, 8 AM - 4 PM)
24 Hr. Emergency Tel # : 613-996-6666 (CANUTEC)

SECTION 2 - HAZARDS IDENTIFICATION

Classification : WHMIS information: This product is packaged and sold as a consumer product. The Hazardous Products Act (HPA) does not apply to consumer products [Hazardous Products Act Section 12(j)].

For informational purposes, this product would have the following WHMIS classification:
Class B3 (Combustible Liquids);
Class D2A (Materials Causing Other Toxic Effects, Very Toxic Material);
Class D2B (Materials Causing Other Toxic Effects, Toxic Material).

Emergency Overview : Light amber liquid. Petroleum odour.
WARNING! Combustible liquid and vapour. Harmful if inhaled. Harmful if absorbed through the skin. Harmful or fatal if swallowed. May cause nausea, vomiting, headache and other central nervous system effects. May cause respiratory irritation. May be an aspiration hazard. May cause skin irritation. Contains material which can cause damage to the blood system, the liver and the kidneys. Contains material which may cause cancer, based on animal data. Possible birth defect hazard - contains material that may cause birth defects, based on animal data.

Contains material that may be harmful in the environment.

POTENTIAL HEALTH EFFECTS:

Signs and symptoms of short-term (acute) exposure

Inhalation : May cause irritation to the nose, throat and upper respiratory tract. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects.

Skin : May cause moderate skin irritation. May be absorbed and cause symptoms similar to those for inhalation.

Eyes : May cause mild eye irritation.

Ingestion : May cause irritation of mouth, throat, and stomach. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects. Material is an aspiration hazard. Aspiration into the lungs during swallowing or subsequent vomiting may cause chemical pneumonitis, which can be fatal.

Effects of long-term (chronic) exposure
: Prolonged or repeated contact may cause drying, cracking and defatting of the skin. Repeated overexposure to naphthalene may cause destruction of red blood cells with anemia, fever, jaundice and kidney and liver damage.

Carcinogenic status : Possible cancer hazard. See TOXICOLOGICAL INFORMATION, Section 11.

Additional health hazards : May cause birth defects. See TOXICOLOGICAL INFORMATION, Section 11.

Potential environmental effects
: Contains material that may be harmful in the environment. See Section 12 for more environmental information.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS #	Wt.%
Petroleum distillates	68476-34-6	80.00 - 90.00
Hydrodesulfurized kerosene	64742-81-0	5.00 - 10.00
Potassium carboxylate	N/Av	1.00 - 5.00
Petroleum naphtha	64742-94-5	0.10 - 1.00
Naphthalene	91-20-3	0.10 - 1.00
Xylene	1330-20-7	0.10 - 1.00

Note: This product is packaged and sold as a consumer product. The Hazardous Products Act (HPA) does not apply to consumer products [Hazardous Products Act Section 12(j)].

SECTION 4 - FIRST AID MEASURES

Inhalation : If inhaled, move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen by qualified medical personnel only. Get medical attention if symptoms persist.

Skin contact : For skin contact, wash with soap and water while removing contaminated clothing. If irritation persists, seek prompt medical attention.

Eye contact : Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists, seek prompt medical attention.

Ingestion : Seek immediate medical attention/advice. Do not induce vomiting. Never give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep victim's head lowered (forward) to reduce the risk of aspiration.

Notes For Physician : Treat symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES

Fire hazards/conditions of flammability

: Combustible liquid and vapour. Will ignite when exposed to heat, flame and other sources of ignition. Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure. Vapours may be heavier than air and may collect in confined and low-lying areas. Material will float on water and can be re-ignited at the water's surface.

Oxidizing properties : None known.

Explosion data: Sensitivity to mechanical impact / static discharge

: Not expected to be sensitive to mechanical impact. May be sensitive to static discharge.

Suitable extinguishing media : Dry chemical, foam, carbon dioxide and water fog. Do not use water jet, as this may spread burning material.

Special fire-fighting procedures/equipment

: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if safe to do so. Water spray may be useful in cooling equipment exposed to heat and flame.

Hazardous combustion products

: Carbon oxides; Nitrogen oxides (NOx); Sulphur oxides; Aldehydes; Hydrocarbons; Other unidentified organic compounds.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions : All persons dealing with the clean-up should wear the appropriate personal protective equipment. Keep all other personnel upwind and away from the spill/release. Restrict access to area until completion of clean-up. Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Ensure spilled product does not enter drains, sewers, waterways, or confined spaces. For large spills, dike the area to prevent spreading.

Spill response/cleanup : Ventilate area of release. Remove all sources of ignition. Use only non-sparking tools and equipment in the clean-up process. Contain and absorb spilled liquid with non-combustible, inert absorbent material (e.g. sand), then place absorbent material into a container for later disposal (see Section 13). Notify the appropriate authorities as required.

Prohibited materials : Do not use combustible absorbents, such as sawdust.

SECTION 7 - HANDLING AND STORAGE

Safe Handling procedures : Use in a well-ventilated area. Wear suitable protective equipment during handling. Avoid breathing vapours. Avoid contact with skin, eyes and clothing. Keep away from heat, sparks and open flames. Use proper bonding and grounding techniques when transferring liquid. Avoid contact with incompatible materials. Wash thoroughly after handling. Keep containers closed when not in use.

Storage requirements : Store in a cool, dry, well-ventilated area. Store away from incompatibles and out of direct sunlight. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. No smoking in the area.

Incompatible materials : Acids; Strong oxidizing agents.

Special packaging materials : Always keep in containers made of the same materials as the supply container.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits

Ingredients	ACGIH TLV		OSHA PEL	
	TWA	STEL	PEL	STEL
Petroleum distillates	100 mg/m³ (vapor and aerosol, as total hydrocarbons) (skin)	N/Av	N/Av	N/Av
Hydrodesulfurized kerosene	200 mg/m³ (Kerosene) (as total hydrocarbon vapour) (skin)	N/Av	N/Av	N/Av
Potassium carboxylate	N/Av	N/Av	N/Av	N/Av
Petroleum naphtha	N/Av	N/Av	500 ppm (2000 mg/m³) (as petroleum distillates, naphtha)	N/Av
Naphthalene	10 ppm (skin)	N/Av	10 ppm (50 mg/m³)	N/Av
Xylene	100 ppm	150 ppm	100 ppm (435 mg/m³)	N/Av

Ventilation and engineering measures : Use general or local exhaust ventilation to maintain air concentrations below recommended exposure limits.

Respiratory protection : If the TLV is exceeded, a NIOSH/MSHA-approved respirator is advised. Advice should be sought from respiratory protection specialists.

Skin protection : Impervious gloves must be worn when using this product. Advice should be sought from glove suppliers. Wear resistant clothing and boots.

Eye / face protection : Chemical splash goggles are recommended.

Other protective equipment : An eyewash station and safety shower should be made available in the immediate working area.

General hygiene considerations : Avoid breathing vapours. Avoid contact with skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink, smoke or use cosmetics while working with this product. Remove and wash contaminated clothing before re-use. Wash thoroughly after handling.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical state : Liquid.

Appearance : Light amber liquid.

Odour : Petroleum odour.

Odour threshold : N/Av

pH : N/Av

Boiling point : 148.9°C

Specific gravity : 0.866

Melting/Freezing point : N/Av

Coefficient of water/oil distribution : N/Av

Vapour pressure (mmHg @ 20° C / 68° F) : N/Av
Vapour density (Air = 1) : N/Av
Volatile organic Compounds (VOC's) : N/Av
Flash point : > 60°C
Flash point Method : TCC
Lower flammable limit (% by vol.) : N/Av
Flame Projection Length : N/Ap
Absolute pressure of container : N/Ap
Solubility in water : Insoluble.
Evaporation rate (n-Butyl acetate = 1) : N/Av
Volatiles (% by weight) : N/Av
Auto-ignition temperature : N/Av
Upper flammable limit (% by vol.) : N/Av
Flashback observed : N/Ap
Viscosity : N/Av
General InformatioIn : No additional information.

Section 10: STABILITY AND REACTIVITY

Stability and reactivity : Stable under the recommended storage and handling conditions prescribed.
Hazardous polymerization : Hazardous polymerization does not occur.
Conditions to avoid : Avoid heat and open flame. Ensure adequate ventilation, especially in confined areas.
Materials To Avoid And Incompatibility : Strong oxidizing agents; Acids
Hazardous decomposition products : None known, refer to hazardous combustion products in Section 5.

SECTION 11 - TOXICOLOGICAL INFORMATION

Target organs : Eyes, skin, respiratory system, central nervous system, blood system, liver, brain and kidneys.
Routes of exposure : *Inhalation:* YES *Skin Absorption:* YES *Skin & Eyes:* YES *Ingestion:* YES
Irritancy : Moderate skin irritant. Mild eye irritant
Toxicological data : There is no available data for the product itself, only for the ingredients. See below for individual ingredient acute toxicity data.

Ingredients	LC_{50}(4hr) inh, rat	LD_{50} (Oral, rat)	LD_{50} (Rabbit, dermal)
Petroleum distillates	> 4.81, < 6 mg/L (aerosol)	7600 mg/kg	> 4300 mg/kg
Hydrodesulfurized kerosene	> 5.2 mg/L (aerosol) (No mortality)	> 5000 mg/kg	> 2000 mg/kg
Potassium carboxylate	N/Av	N/Av	N/Av
Petroleum naphtha	> 17.1 mg/L (mist)	> 6000 mg/kg	> 3160 mg/kg
Naphthalene	N/Av	490 mg/kg (rat) 533 mg/kg (mouse)	> 20 000 mg/kg
Xylene	6350 ppm (27.6 mg/L) (vapour)	3253 mg/kg	12 180 mg/kg

Carcinogenic status : Contains Naphthalene. Naphthalene is classified as carcinogenic by IARC (Group 2B) and NTP (Group 2 - Reasonably anticipated). Contains the following chemicals listed as confirmed animal carcinogens (A3) by ACGIH: Petroleum distillates; Hydrodesulfurized kerosene.
Reproductive effects : Not expected to cause reproductive effects.
Teratogenicity : This product contains Xylene. Xylene may cause fetotoxic effects at doses which are not maternally toxic, based on animal data.
Mutagenicity : Not expected to be mutagenic in humans.
Epidemiology : None known or reported by the manufacturer.
Sensitization to material : May cause an allergic skin reaction (e.g. hives, rash) in some hypersensitive individuals. No data available to indicate product or components may be respiratory sensitizers.
Synergistic materials : None known or reported by the manufacturer.
other important hazards : CNS depression may result from extreme exposures.
Conditions aggravated by overexposure : Pre-existing skin, eye, respiratory or blood system disorders.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity : The ecological characteristics of this product have not been fully investigated. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters. This product contains the following substance which may also be hazardous for the environment: petroleum distillates; Hydrodesulfurized kerosene; Petroleum naphtha; Naphthalene; Xylene.

See the following tables for individual ingredient ecotoxicity data.

Ecotoxicity data:

Ingredients	CAS No	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Petroleum distillates	68476-34-6	57 mg/L (Fathead minnow)	N/Av	None.
Hydrodesulfurized kerosene	64742-81-0	20 mg/L (Rainbow trout)	N/Av	None.
Petroleum naphtha	64742-94-5	3.6 mg/L (Rainbow trout)	N/Av	None.
Naphthalene	91-20-3	0.96 mg/L (pink salmon)	0.12 mg/L/40 days	1
Xylene	1330-20-7	8.2 mg/L (Rainbow trout)	N/Av	None.

Ingredients	CAS No	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Petroleum distillates	68476-34-6	68 mg/L (Daphnia magna)	0.2 mg/L	None.
Hydrodesulfurized kerosene	64742-81-0	1 - 2 mg/L (Daphnia magna)	0.48 mg/L (NOEL)	None.
Petroleum naphtha	64742-94-5	1.1 mg/L (Daphnia magna)	N/Av	None.
Naphthalene	91-20-3	3.4 mg/L (Daphnia magna)	0.22 - 0.6 mg/L	None.
Xylene	1330-20-7	3.2 - 9.56 mg/L (Daphnia magna)	N/Av	None.

Ingredients	CAS No	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Petroleum distillates	68476-34-6	> 10 mg/L/72hr (Green algae)	1 mg/L/72hr	None.
Hydrodesulfurized kerosene	64742-81-0	6.2 mg/L/96hr (Green algae)	0.4 mg/L/96hr (NOEL)	None.
Petroleum naphtha	64742-94-5	7.2 mg/L/72hr (Green algae)	0.22 mg/L/72hr	None.
Naphthalene	91-20-3	0.4 mg/L/72hr (Skeletonema costatum)	N/Av	1
Xylene	1330-20-7	3.2 - 4.9 mg/L/72hr (Green algae)	N/Av	None.

Mobility : No data is available on the product itself.

Persistence : No data is available on the product itself.
Contains the following chemicals which are not readily biodegradable: Hydrodesulfurized kerosene; Petroleum naphtha; Naphthalene.
Contains the following chemicals which are considered to be inherently biodegradable: Xylene.
The following ingredients are considered to be readily biodegradable: Petroleum distillates.
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Bioaccumulation potential : No data is available on the product itself. See the following data for ingredient information.

Components	Partition coefficient n-octanol/water (log Kow)	Bioconcentration factor (BCF)
Petroleum distillates (CAS 68476-34-6)	3.9 - 6	N/Av
Hydrodesulfurized kerosene (CAS 64742-81-0)	3.3 - 6+	142 - 11 430 (calculated)
Petroleum naphtha (CAS 64742-94-5)	> 3, < 6.5	N/Av
Naphthalene (CAS 91-20-3)	3.7	427 (Fathead minnow)
Xylene (CAS 1330-20-7)	3.12 - 3.2	50 - 58

Other Adverse Environmental effects

: No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

SECTION 13 - DISPOSAL CONSIDERATIONS

Handling for Disposal : Handle waste according to recommendations in Section 7. Do not cut, weld, drill or grind on or near this container. Empty containers retain residue (liquid and/or vapour) and can be dangerous.

Methods of Disposal : Dispose of in accordance with federal, provincial and local hazardous waste laws.

SECTION 14: TRANPORT INFORMATION

Regulatory Information	UN Number	Shipping Name	Class	Packing Group	Label
TDG	None	Not regulated.	Not regulated	None	
TDG Additional information	None.				

SECTION 15 - REGULATORY INFORMATION

Labelling:

This product is packaged and sold as a consumer product. The Hazardous Products Act (HPA) does not apply to consumer products [Hazardous Products Act Section 12(j)]. As such, this product does not require a WHMIS Supplier label.

Canadian Information:

Canadian Environmental Protection Act (CEPA) information: All ingredients listed appear on the Domestic Substances List (DSL).

WHMIS information: Refer to Section 2 for a WHMIS Classification for this product.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

US Federal Information:

TSCA: All listed ingredients appear on the Toxic Substances Control Act (TSCA) inventory.

SECTION 16 - OTHER INFORMATION

Legend : ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstract Services
CNS: Central Nervous System
HSDB: Hazardous Substances Data Bank
IARC: International Agency for Research on Cancer
Inh: Inhalation
LC: Lethal Concentration

LD: Lethal Dose
MSHA: Mine Safety and Health Administration
N/Ap: Not Applicable
N/Av: Not Available
NIOSH: National Institute of Occupational Safety and Health
NOEC: No observable effect concentration
NTP: National Toxicology Program
OECD: Organisation for Economic Co-operation and Development
OSHA: Occupational Safety and Health Administration
PEL: Permissible exposure limit
RTECS: Registry of Toxic Effects of Chemical Substances
STEL: Short Term Exposure Limit
TCC: Tagliabue Closed Cup
TDG: Canadian Transportation of Dangerous Goods Act & Regulations
TLV: Threshold Limit Values
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Identification System

References : 1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices for 2016.
2. International Agency for Research on Cancer Monographs, searched 2016.
3. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases, 2016 (Chempendium, HSDB and RTECs).
4. Material Safety Data Sheets from manufacturer.
5. OECD - The Global Portal to Information on Chemical Substances - eChemPortal, 2016.

Prepared for: Radiator Specialty Co. of Canada 1711 Aimco Blvd. Mississauga, ON, Canada, L4W 1H7 Telephone: 905-625-9117 (Mon. - Fri., 8 AM - 4 PM) Please direct all enquiries to Radiator Specialty.	
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12. ECOLOGICAL INFORMATION.

END OF DOCUMENT