BRAKE FLUID DOT 4 M4512C

MSDS Revision Date (mm/dd/yyyy): 07/25/2016

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MATERIAL SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

Product identifier : BRAKE FLUID DOT 4

Product Use : Brake fluid
Chemical Family : Glycol mixture.
Manufacturer part no. : M4512C

Supplier's name and address: Manufacturer's name and address:

Radiator Specialty Co., of Canada Refer to Supplier

1711 Aimco Blvd.

Mississauga, ON, Canada

L4W 1H7

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 D2B (Materials Causing Other Toxic Effects, Toxic Material).

Emergency Overview: Yellow liquid. Slight ethereal odour.

Caution! May be harmful if inhaled. May be harmful if swallowed. Causes eye irritation. May cause

respiratory irritation.

POTENTIAL HEALTH EFFECTS:

Signs and symptoms of short-term (acute) exposure

Inhalation: If product is heated or mists are formed, inhalation may cause irritation to the nose, throat and respiratory

tract

Skin : May cause mild skin irritation.

Eyes : May cause moderate to severe irritation.

Ingestion: May cause irritation of mouth, throat, and stomach. May cause nausea, stomach pain and vomiting.

Effects of long-term (chronic) exposure

: Prolonged overexposure may cause liver and kidney effects.

Carcinogenic status : See TOXICOLOGICAL INFORMATION, Section 11.

Additional health hazards : See TOXICOLOGICAL INFORMATION, Section 11.

Potential environmental effects

: See ECOLOGICAL INFORMATION, Section 12.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredients</u>	CAS#	Wt.%		
Triethylene glycol monomethyl ether borate ester	30989-05-0	15.00 - 40.00		
Triethylene glycol monomethyl ether	112-35-6	10.00 - 30.00		
Polyethylene glycol monomethyl ether	9004-74-4	10.00 - 30.00		
Triethylene glycol monobutyl ether	143-22-6	8.00 - 18.00		
Polyalkylene glycol monobutyl ether	9004-77-7	7.00 - 13.00		

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Tetraethylene glycol	112-60-7	0.00 - 10.00
Triethylene glycol	112-27-6	0.00 - 5.00
Pentaethylene glycol	4792-15-8	0.00 - 5.00
Diisopropanolamine	110-97-4	0.00 - 1.50
sodium hydroxide	1310-73-2	0.00 - 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 : Immediately remove person to fresh air. If breathing has stopped, give artificial respiration. If

breathing is difficult, give oxygen by qualified medical personnel only. If irritation persists,

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seek prompt medical attention.

Skin contact Remove/Take off immediately all contaminated clothing. Wash exposed area thoroughly with soap and water for at least 15 minutes. If irritation persists, seek prompt medical

attention.

: Immediately flush eyes with plenty of water for at least 15 minutes. Seek immediate medical Eye contact

attention/advice.

Ingestion Do not induce vomiting. Never give anything by mouth to an unconscious person. Get

medical attention if symptoms persist.

Notes For Physician : Treat symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES

Fire hazards/conditions of flammability

: Not flammable under normal conditions of use. However, may ignite if exposed to extreme heat and flame. Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure. Vapours are heavier than air and collect in confined and low-lying areas.

Oxidizing properties

: None known.

Explosion data: Sensitivity to mechanical impact / static discharge

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

Suitable extinguishing media : Dry chemical, alcohol foam, carbon dioxide, or water spray.

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); formaldehyde; Other unidentified organic compounds.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions

All persons dealing with the clean-up should wear the appropriate chemically 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 Spill response/cleanup

: Ensure spilled product does not enter drains, sewers, waterways, or confined spaces.

Ventilate area of release. Remove all sources of ignition. 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. Do not breathe vapours or spray mist. Do not ingest. Avoid contact with skin, eyes and clothing. Keep away from heat and flame. 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. Keep away from 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 : Strong oxidizing agents; Acids; Bases. MSDS Revision Date (mm/dd/yyyy): 07/25/2016

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					
	ACGIH TLV		OSHA	A PEL	
<u>Ingredients</u>	<u>TWA</u>	STEL	<u>PEL</u>	STEL	
Triethylene glycol monomethyl ether borate ester	N/Av	N/Av	N/Av	N/Av	
Triethylene glycol monomethyl ether	N/Av	N/Av	N/Av	N/Av	
Polyethylene glycol monomethyl ether	N/Av	N/Av	N/Av	N/Av	
Triethylene glycol monobutyl ether	N/Av	N/Av	N/Av	N/Av	
Polyalkylene glycol monobutyl ether	N/Av	N/Av	N/Av	N/Av	
Tetraethylene glycol	N/Av	N/Av	N/Av	N/Av	
Triethylene glycol	N/Av	N/Av	N/Av	N/Av	
Pentaethylene glycol	N/Av	N/Av	N/Av	N/Av	
Diisopropanolamine	N/Av	N/Av	N/Av	N/Av	
sodium hydroxide	2 mg/m³ (Ceiling)	N/Av	2 mg/m³	N/Av	

Ventilation and engineering measures

: Use in a well-ventilated area. Use general or local exhaust ventilation to maintain air concentrations below recommended exposure limits.

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

sought from respiratory protection specialists.

Skin protection Impervious gloves must be worn when using this product. Advice should be sought from

glove suppliers. Depending on conditions of use, an impervious apron should be worn.

Eye / face protection Chemical splash goggles are recommended.

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

area.

General hygiene considerations

Do not ingest. Avoid breathing vapors or mists. Avoid contact with skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice. Wash contaminated clothing before reuse. Wash hands thoroughly after using this product, and before eating, drinking or smoking.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical state liquid Appearance : Yellow liquid.

Odour Ammonia odour. Odour threshold : N/Av

рΗ 7.7 (estimated)

Boiling point 282°C @ 760 mmHg : 1.05 Specific gravity

Melting/Freezing point Coefficient of water/oil distribution

: N/Av

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Vapour pressure (mmHg @ 20° C / 68° F) : Soluble Solubility in water

: < 0.01 (estimated)

: > 10 (estimated) Vapour density (Air = 1) Evaporation rate (n-Butyl acetate = 1) : N/Av

Volatile organic Compounds (VOC's) Volatiles (% by weight) : N/Av

: N/Av

N/Av

Flash point 132.2°C

Flash point Method : closed cup Auto-ignition temperature : Not available.

Upper flammable limit (% by vol.) Lower flammable limit (% by vol.)

: N/Av

Flame Projection Length : N/Ap Flashback observed : N/Ap **BRAKE FLUID DOT 4** M4512C

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: N/Av Absolute pressure of container Viscosity

: N/Ap

General Information : No additional information.

Section 10: STABILITY AND REACTIVITY

Stable under the recommended storage and handling conditions prescribed. May form Stability and reactivity

explosive peroxides during prolonged exposure to air and heat.

Hazardous polymerization Hazardous polymerization does not occur.

Conditions to avoid Avoid heat and open flame. Keep away from direct sunlight. Do not use in areas without

adequate ventilation.

Materials To Avoid And Incompatibility

: Strong oxidizing agents; Strong acids; Strong bases.

Hazardous decomposition products
: Peroxides Refer to Section 5 for additional 'Hazardous combustion products'.

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SECTION 11 - TOXICOLOGICAL INFORMATION

: Eyes, skin, respiratory system, digestive system, central nervous system. Liver; Kidneys **Target organs**

Routes of exposure : *Inhalation*: YES Skin Absorption: YES Skin & Eyes: YES Ingestion: YES

Irritancy : Mild skin irritant.. Moderate to severe eye irritant.

There is no available data for the product itself, only for the ingredients. See below for Toxicological data

individual ingredient acute toxicity data.

	LC50 (4hr)	LD ₅₀		
<u>Ingredients</u>	inh, rat	(Oral, rat)	(Rabbit, dermal)	
Triethylene glycol monomethyl ether borate ester	N/Av	> 5000 mg/kg	> 2000 mg/kg	
Triethylene glycol monomethyl ether	N/Av	11 800 mg/kg	7400 mg/kg	
Polyethylene glycol monomethyl ether	N/Av	> 22 mL/kg	> 20 mL/kg	
Triethylene glycol monobutyl ether	N/Av	5300 mg/kg	> 2000 mg/kg	
Polyalkylene glycol monobutyl ether	N/Av	> 2000 mg/kg	N/Av	
Tetraethylene glycol	> 5 mg/L (aerosol) (No mortality)	34 700 mg/kg	22 600 mg/kg	
Triethylene glycol	> 5.0 mg/L (aerosol) (No mortality)	9500 - 22 060 mg/kg	> 18 000 mg/kg	
Pentaethylene glycol	N/Av	> 16 000 mg/kg	N/Av	
Diisopropanolamine	> 2.069 mg/L (aerosol) (No mortality) (mouse)	> 2000 - 3980 mg/kg	8000 mg/kg	
sodium hydroxide	N/Av	N/Av	N/Av	

Carcinogenic status : No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.

Reproductive effects Not expected to have other reproductive effects.

Teratogenicity : Not expected to be a teratogen.

Mutagenicity Not expected to be mutagenic in humans. **Epidemiology** None known or reported by the manufacturer. Sensitization to material Not expected to be a skin or respiratory sensitizer. Synergistic materials None known or reported by the manufacturer. other important hazards None known or reported by the manufacturer.

Conditions aggravated by overexposure

: Pre-existing skin, eye and respiratory disorders.

SECTION 12 - ECOLOGICAL INFORMATION

No data is available on the product itself. The product should not be allowed to enter drains **Ecotoxicity**

or water courses, or be deposited where it can affect ground or surface waters.

See the following tables for individual ingredient ecotoxicity data.

Ecotoxicity data:

		Toxicity to Fish		
<u>Ingredients</u>	CAS No	LC50 / 96h	NOEC / 21 day	M Factor
Triethylene glycol monomethyl ether borate ester	30989-05-0	> 222 mg/L (Rainbow trout) (Read-across)	N/Av	None.
Triethylene glycol monomethyl ether	112-35-6	> 10 000 mg/L (Fathead minnow)	N/Av	None.
Polyethylene glycol monomethyl ether	9004-74-4	N/Av	N/Av	None.
Triethylene glycol monobutyl ether	143-22-6	2400 mg/L	N/Av	None.
Polyalkylene glycol monobutyl ether	9004-77-7	> 1800 mg/L (Turbot)	N/Av	None.
Tetraethylene glycol	112-60-7	> 10 000 mg/L (Fathead minnow)	N/Av	None.
Triethylene glycol	112-27-6	69 800 mg/L (Fathead minnow)	> 1500 mg/L/28-day Atlantic silverside (Menidia menidia)	None.
Pentaethylene glycol	4792-15-8	> 50 000 mg/L (Fathead minnow)	N/Av	None.
Diisopropanolamine	110-97-4	≥ 1000 mg/L, ≤ 2200 mg/L (Zebra fish)	N/Av	None.
sodium hydroxide	1310-73-2	125 mg/L (Mosquito fish)	N/Av	None.

<u>Ingredients</u>	CAS No	Toxicity to Daphnia			
		EC50 / 48h	NOEC / 21 day	M Factor	
Triethylene glycol monomethyl ether borate ester	30989-05-0	> 500 mg/L (Daphnia magna)	N/Av	None.	
Triethylene glycol monomethyl ether	112-35-6	> 10 000 mg/L (Daphnia magna)	N/Av	None.	
Polyethylene glycol monomethyl ether	9004-74-4	N/Av	N/Av	None.	
Triethylene glycol monobutyl ether	143-22-6	2210 mg/L (Daphnia magna)	N/Av	None.	
Polyalkylene glycol monobutyl ether	9004-77-7	4800 mg/L (Daphnia magna) (QSAR)	N/Av	None.	
Tetraethylene glycol	112-60-7	7800 mg/L (Daphnia magna)	N/Av	None.	
Triethylene glycol	112-27-6	39 000 mg/L (Daphnia magna)	> 15 000 mg/L	None.	
Pentaethylene glycol	4792-15-8	> 20 000 mg/L (Daphnia magna)	N/Av	None.	
Diisopropanolamine	110-97-4	277.7 mg/L (Daphnia magna)	N/Av	None.	
sodium hydroxide	1310-73-2	40.4 mg/L (Daphnia magna)	N/Av	None.	

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<u>Ingredients</u>	CAS No	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Triethylene glycol monomethyl ether borate ester	30989-05-0	> 500 mg/L/72hr (Green algae)	N/Av	None.
Triethylene glycol monomethyl ether	112-35-6	> 500 mg/L/96hr (Green algae)	N/Av	None.
Polyethylene glycol monomethyl ether	9004-74-4	N/Av	N/Av	None.
Triethylene glycol monobutyl ether	143-22-6	> 500 mg/L/72hr (Green algae)	N/Av	None.
Polyalkylene glycol monobutyl ether	9004-77-7	391 mg/L/72hr (Skeletonema costatum)	N/Av	None.
Tetraethylene glycol	112-60-7	> 100 mg/L/72hr (Diatom)	100 mg/L/72hr (Diatom)	None.
Triethylene glycol	112-27-6	> 100 mg/L (Green algae)	N/Av	None.
Pentaethylene glycol	4792-15-8	N/Av	N/Av	None.
Diisopropanolamine	110-97-4	270 mg/L/72hr (Green algae)	125mg/L (Green algae)	None.
sodium hydroxide	1310-73-2	N/Av	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: sodium hydroxide. Contains the following chemicals which are considered to be inherently biodegradable: Tetraethylene glycol; Pentaethylene glycol.

The following ingredients are considered to be readily biodegradable: Triethylene glycol monomethyl ether borate ester; Triethylene glycol monomethyl ether; Polyethylene glycol monomethyl ether; Triethylene glycol monobutyl ether; Polyalkylene glycol monobutyl ether; Triethylene glycol; Diisopropanolamine.

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)
Triethylene glycol monomethyl ether borate ester (CAS 30989-05-0)	- 4.37	N/Av
Triethylene glycol monomethyl ether (CAS 112-35-6)	- 1.46 (calculated)	N/Av
Triethylene glycol monobutyl ether (CAS 143-22-6)	0.51	N/Av
Polyalkylene glycol monobutyl ether (CAS 9004-77-7)	0.436	N/Av
Tetraethylene glycol (CAS 112-60-7)	- 2.02 (estimated)	3 (estimated)
Triethylene glycol (CAS 112-27-6)	- 1.7 (estimated)	3.162 (estimated)
Pentaethylene glycol (CAS 4792-15-8)	- 2.3	N/Av
Diisopropanolamine (CAS 110-97-4)	- 0.79	3.16 (estimated)

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. 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.

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SECTION 14: TRANPORT INFORMATION

Regulatory Information	UN Number	Shipping Name	Class	Packing Group	Label
TDG	None	Not regulated.	Not regulated	None	\otimes
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

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.
 - 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.

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Prepared for:

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MSDS Preparation Date (mm/dd/yyyy)

: 08/09/2007

MSDS Revision Date (mm/dd/yyyy)

: 07/25/2016

Revision No. : 5

Revision Information: (M)SDS sections updated:

12. ECOLOGICAL INFORMATION.

END OF DOCUMENT