

MATERIAL SAFETY DATA SHEET**SECTION 1: IDENTIFICATION****Product identifier** : **DOT 5 SILICONE BRAKE FLUID****Product Use** : Automotive - Brake Fluid.**Chemical Family** : Mixture.**Manufacturer part no.** : M4011C**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 a WHMIS Controlled Product. It meets one or more of the criteria for a controlled product provided in Part IV of the Canadian Controlled Products Regulations (CPR). WHMIS classification:
Class D2B (Materials Causing Other Toxic Effects, Toxic Material).Labelling: Phrases recommended to appear on a supplier label, can be found in Section 15.
WHMIS symbols required on a supplier label:**Emergency Overview** : Clear blue liquid. Odourless.
Caution! May cause respiratory irritation. May cause moderate to severe eye irritation. May cause mild skin irritation. Inhalation may cause central nervous system depression. May have laxative effects. May cause liver and kidney damage.**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. May produce mild central nervous system depression characterized by headache, nausea, vertigo, and stupor.*Skin* : May cause mild skin irritation. May be absorbed through the skin.*Eyes* : May cause moderate to severe eye irritation.*Ingestion* : May cause irritation of mouth, throat, and stomach. Ingestion of large amounts may cause nausea, vomiting, diarrhea, as well as depression of the central nervous system.**Effects of long-term (chronic) exposure**

: Prolonged skin contact may cause dermatitis (rash), characterized by red, dry, itching skin. May cause damage to the liver and kidneys through prolonged or repeated exposure if ingested.

Carcinogenic status : Contains material which may cause cancer, based on animal data. 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.% |
|-------------------------------------------|--------------|----------------|
| Dimethylpolysiloxane | 63148-62-9 | 60.00 - 100.00 |
| Tributyl phosphate | 126-73-8 | 1.00 - 5.00 |
| Decanedioic acid, bis(2-ethylhexyl) ester | 122-62-3 | 1.00 - 5.00 |

SECTION 4 - FIRST AID MEASURES

- Inhalation** : If inhaled, move to fresh air. If breathing has stopped, give artificial respiration. Consult a physician.
- Skin contact** : Remove contaminated clothing. Wash off immediately with soap and plenty of water. If irritation persists, seek prompt medical attention.
- Eye contact** : Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if symptoms persist.
- 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. 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. 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 or 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; Phosphorus compounds ; Silicon oxides; 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** : 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. 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 with adequate ventilation. Wear suitable protective equipment during handling. Avoid breathing vapours. Avoid contact with skin, eyes and clothing. Keep away from heat, sparks and open flames. 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. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks.
- Incompatible materials** : Bases; Acids; Oxidizing agents; Metal salts.

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

| <u>Ingredients</u> | <u>ACGIH TLV</u> | | <u>OSHA PEL</u> | |
|-------------------------------------------|--------------------------------------------|-------------|---------------------|-------------|
| | <u>TWA</u> | <u>STEL</u> | <u>PEL</u> | <u>STEL</u> |
| Dimethylpolysiloxane | N/Av | N/Av | N/Av | N/Av |
| Tributyl phosphate | 5 mg/m ³ (inhalable) (vapor) | N/Av | 5 mg/m ³ | N/Av |
| Decanedioic acid, bis(2-ethylhexyl) ester | N/Av | N/Av | N/Av | 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.

Respiratory protection

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

Skin protection

- : Gloves impervious to the material are recommended. Advice should be sought from glove suppliers. Depending on conditions of use, an impervious apron should be worn.

Eye / face protection

- : Safety glasses with side-shields or chemical splash goggles.

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. 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 | : Viscous liquid | Appearance | : Blue liquid. |
| Odour | : odourless | Odour threshold | : N/Av |
| pH | : N/Av | | |
| Boiling point | : 260°C | Specific gravity | : 0.95 @ 20°C |
| Melting/Freezing point | : N/Av | Coefficient of water/oil distribution | : N/Av |
| Vapour pressure (mmHg @ 20° C / 68° F) | : 1 | Solubility in water | : Insoluble. |
| Vapour density (Air = 1) | : > 1 | Evaporation rate (n-Butyl acetate = 1) | : N/Av |
| Volatile organic Compounds (VOC's) | : 0% | Volatiles (% by weight) | : 85% |
| Flash point | : 182°C | | |
| Flash point Method | : TCC | Auto-ignition temperature | : Not available. |
| Lower flammable limit (% by vol.) | : N/Av | Upper flammable limit (% by vol.) | : N/Av |
| Flame Projection Length | : N/Av | Flashback observed | : N/Av |
| Absolute pressure of container | : N/Av | Viscosity | : 42.7 cSt |
| General Information | : No additional information. | | |

Section 10: STABILITY AND REACTIVITY

| | |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stability and reactivity | : Stable under the recommended storage and handling conditions prescribed. May slowly decompose to phosphoric acid and butene at temperatures above the boiling point. May slowly hydrolyze in the presence of water to: Phosphoric acid; butanol. |
| Hazardous polymerization | : Hazardous polymerization does not occur. |
| Conditions to avoid | : Avoid heat and open flame. Do not use in areas without adequate ventilation. |
| Materials To Avoid And Incompatibility | : Acids; Bases; Oxidizing agents; Metal salts. |

Hazardous decomposition products

: Phosphoric acid. Refer to Section 5 for additional 'Hazardous combustion products'.

SECTION 11 - TOXICOLOGICAL INFORMATION

Target organs : Eyes, skin, respiratory system and digestive system. Liver; Kidneys

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

Irritancy : Mild skin irritant. Moderate 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.

| <u>Ingredients</u> | LC₅₀ (4hr) <u>inh, rat</u> | LD₅₀ | |
|-------------------------------------------|-------------------------------------------------|------------------------|-------------------------|
| | | <u>(Oral, rat)</u> | <u>(Rabbit, dermal)</u> |
| Dimethylpolysiloxane | N/Av | > 2000 mg/kg | > 19 400 mg/kg |
| Tributyl phosphate | 7000 mg/m ³ (aerosol) | 1390 mg/kg | > 3100 mg/kg |
| Decanedioic acid, bis(2-ethylhexyl) ester | > 3.2 mg/L (aerosol) | > 4560 mg/kg | > 2000 mg/kg |

Carcinogenic status : Contains the following chemicals listed as confirmed animal carcinogens (A3) by ACGIH: Tributyl phosphate. No other components are classified as carcinogenic by IARC, ACGIH, 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 : CNS depression may result from extreme exposures.

Conditions aggravated by overexposure : None known or reported by the manufacturer.

SECTION 12 - ECOLOGICAL INFORMATION

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

| <u>Ingredients</u> | CAS No | Toxicity to Fish | | |
|-------------------------------------------|---------------|--------------------------------------------------|----------------------|-----------------|
| | | LC50 / 96h | NOEC / 21 day | M Factor |
| Dimethylpolysiloxane | 63148-62-9 | 350 mg/L Pleuronectes platessa (European plaice) | N/Av | None. |
| Tributyl phosphate | 126-73-8 | 4.2 - 18 mg/L (various) | N/Av | None. |
| Decanedioic acid, bis(2-ethylhexyl) ester | 122-62-3 | > 1000 mg/L (Golden orfe) | N/Av | None. |

| <u>Ingredients</u> | CAS No | Toxicity to Daphnia | | |
|-------------------------------------------|---------------|------------------------------|----------------------|-----------------|
| | | EC50 / 48h | NOEC / 21 day | M Factor |
| Dimethylpolysiloxane | 63148-62-9 | > 200 mg/L (Daphnia magna) | N/Av | None. |
| Tributyl phosphate | 126-73-8 | 2.6 - 9 mg/L (Daphnia magna) | 0.82 mg/L | None. |
| Decanedioic acid, bis(2-ethylhexyl) ester | 122-62-3 | > 1000 mg/L (Daphnia magna) | N/Av | None. |

| <u>Ingredients</u> | CAS No | Toxicity to Algae | | |
|-------------------------------------------|------------|--------------------------------|-------------------|----------|
| | | EC50 / 96h or 72h | NOEC / 96h or 72h | M Factor |
| Dimethylpolysiloxane | 63148-62-9 | N/Av | N/Av | None. |
| Tributyl phosphate | 126-73-8 | 1.1 mg/L/72hr (Green algae) | 2.2 mg/L/96hr | None. |
| Decanedioic acid, bis(2-ethylhexyl) ester | 122-62-3 | > 1000 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: Decanedioic acid, bis(2-ethylhexyl) ester.

Bioaccumulation potential : No data is available on the product itself. See the following data for ingredient information.

| <u>Components</u> | <u>Partition coefficient n-octanol/water (log Kow)</u> | <u>Bioconcentration factor (BCF)</u> |
|----------------------------------------------------------|--------------------------------------------------------|--------------------------------------|
| Tributyl phosphate (CAS 126-73-8) | 3.99 - 4.01 | 5.5 - 35 (Fish) |
| Decanedioic acid, bis(2-ethylhexyl) ester (CAS 122-62-3) | 10.1 | 4 (calculated) |

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.

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

SECTION 14: TRANSPORT 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:

Caution! May cause respiratory irritation. Causes eye irritation. May cause headache, nausea, dizziness and other symptoms of central nervous system depression. Liver and kidney injuries may occur.

Precautions: 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 extreme heat and flame. Avoid contact with incompatible materials. Keep containers closed when not in use. Wash thoroughly after handling. Store in a cool, dry, well ventilated area, away from heat and ignition sources.

FIRST AID: If inhaled, move to fresh air. If breathing stops, provide artificial respiration. Consult a physician. For skin contact, wash with soap and water while removing contaminated clothing. If irritation persists, seek prompt medical attention. For eye contact, flush with running water for at least 15 minutes. Get medical attention if symptoms persist. If ingested, do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention if symptoms persist.

Refer To Material Safety Data Sheet for further information.

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, CCIInfoWeb 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:

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12. ECOLOGICAL INFORMATION.**END OF DOCUMENT**