SAFETY DATA SHEET

Castrol Radicool SF Premix

MSDS Approval Number AA00907-0000000209

In accordance with the Standard for Classification and Labeling of Chemical Substance and Safety Data Sheet, Article 10 Paragraph 1

Section 1. Chemical product and company identification

A. Product name Castrol Radicool SF Premix

Product code 467493-TH01

SDS # 467493

B. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/ mixture Coolant and antifreeze.
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

Identified uses

Not applicable.

Uses advised against

Not applicable.

C. Manufacturer

Supplier BP Korea Ltd.
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EMERGENCY TELEPHONE NUMBER Carechem: +65 3158 1074 (24/7)

Section 2. Hazards identification

A. Hazard classification

ACUTE TOXICITY (oral) - Category 4
REPRODUCTIVE TOXICITY - Category 1B
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2

This product is classified in accordance with the Industrial Safety and Health Act and the Chemical Control Act.

B. GHS label elements, including precautionary statements

Symbol

Signal word Danger

Section 2. Hazards identification

Hazard statements

H302 - Harmful if swallowed.
H360 - May damage fertility or the unborn child.
H373 - May cause damage to organs through prolonged or repeated exposure. (kidneys)

Precautionary statements

General

P102 - Keep out of reach of children.
P101 - If medical advice is needed, have product container or label at hand.

Prevention

P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P280 - Wear protective gloves, protective clothing and eye or face protection.
P260 - Do not breathe vapour.
P270 - Do not eat, drink or smoke when using this product.
P264 - Wash hands thoroughly after handling.

Response

P308 + P313 - IF exposed or concerned: Get medical attention.
P301 + P312, P330 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. Rinse mouth.

Storage

P405 - Store locked up.

Disposal

P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

C. Other hazards which do not result in classification

None known.

Section 3. Composition/information on ingredients

Substance/mixture

Mixture

Other means of identification

Not available.

Ethylene glycol Corrosion inhibitor.

Hazardous ingredients

Ingredient name	Synonym	CAS number	%
Ethylene glycol	ethylene glycol; ethane-1,2-diol; 1,2-Ethanediol; Glycol; Monoethylene glycol; 1,2-Ethanediol (ethylene glycol); Glycol alcohol; 1,2-Dihydroxyethane; catalyst, containing N-(2-hydroxypropylammonium) diazabicyclo[2,2,2]octane-2-ethyl hexanoate, dissolved in ethane-1,2-diol; glycol; monoethylene glycol; monoethyleneglycol; Ethylene glycol, aerosol	107-21-1	79.9
Sodium 2-ethylhexanoate	Hexanoic acid, 2-ethyl-, sodium salt (1:1); Hexanoic acid, 2-ethyl-, sodium salt; Aliphatic monocarboxylic acid (C6-28) light metal salt (Na,K,Li,Ba,Mg,Ca); 2-Ethylhexanoic acid	19766-89-3	2.9

	sodium salt; HEXANOATE, 2-ETHYL-, SODIUM; Sodium 2-ethyl hexanoate; 2-Ethylhexanoic acid sodium salt		

Non-hazardous ingredients

No non-hazardous ingredients

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

A. Eye contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention if symptoms occur.

B. Skin contact

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention. If skin irritation or rash occurs: Get medical advice/attention.

C. Inhalation

If inhaled, remove to fresh air. Get medical attention.

D. Ingestion

If ingested, call a physician or Poison Control Center immediately. Get medical attention urgently informing the doctor that a product containing ethylene glycol has been ingested and specific treatment may be required. Transport casualty together with the product container, its label, or the safety data sheet urgently to hospital. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately.

E. Notes to physician

Specific treatments

Ethylene Glycol: Gastric irrigation, ethanol or fomepizole may have value in treatment. Consult physician.

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Firefighting measures

A. Extinguishing media

Suitable

In case of fire, use water fog, alcohol resistant foam, dry chemical or carbon dioxide extinguisher or spray.

Not suitable

Do not use water jet.

Section 5. Firefighting measures

B. Specific hazards arising from the chemical

In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products

Combustion products may include the following:
metal oxide/oxides
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

C. Special protective equipment for fire-fighters

Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Special precautions for fire-fighters

No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.

Section 6. Accidental release measures

A. Personal precautions, protective equipment and emergency procedures

Contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.

B. Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

C. Methods and material for containment and cleaning up

Small spill

Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill

Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spilt product. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. Contaminated work clothing should not be allowed out of the workplace. See also Section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/ containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Not suitable

Prolonged exposure to elevated temperature

Section 8. Exposure controls/personal protection

A. Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Ethylene glycol	**ISHA Article 42 (Republic of Korea)** CEIL: 100 mg/m³. Form: Vapour and mists. Issued/Revised: 1/2009.

Biological exposure indices

No exposure indices known.

B. Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.

Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.

Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.

The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

C. Personal protective equipment

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.

The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Eye protection

Safety glasses with side shields.

Section 8. Exposure controls/personal protection

Hand protection

Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Butyl gloves. Neoprene gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Skin protection

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 9. Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

A. Appearance

Physical state Liquid.

Colour Red.

B. Odour Not available.

C. Odour threshold Not available.

D. pH 7.5 to 9 [Conc. (% w/w): 50%]

E. Melting/freezing point Not available.

F. Boiling point or initial boiling point and boiling range 170°C (338°F)

G. Flash point

	Closed cup			Open cup		
Ingredient name	**°C**	**°F**	**Method**	**°C**	**°F**	**Method**
Ethylene glycol	111	231.8				

H. Evaporation rate Not available.

I. Flammability (solid, gas) Not available.

J. Lower and upper explosive (flammable) limits Not available.

K. Vapour pressure

Section 9. Physical and chemical properties

Ingredient name	Vapour Pressure at 20˚C			Vapour pressure at 50˚C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Ethylene glycol	0.09226	0.012				
Sodium 2-ethylhexanoate	<0.000000008	<0.0000000011		<0.000000008	<0.0000000011	

L. Solubility(ies)

Media	Result
water	Miscible in water.

M. Vapour density Not available.

N. Relative density Not available.

Density >1000 kg/m³ (>1 g/cm³) at 20°C

O. Partition coefficient: n-octanol/water Not applicable.

P. Auto-ignition temperature

Ingredient name	°C	°F	Method
Ethylene glycol	398	748.4	

Q. Decomposition temperature Not available.

R. Viscosity Not available.

Particle characteristics

Median particle size Not applicable.

Section 10. Stability and reactivity

A. Chemical stability The product is stable.

Possibility of hazardous reactions Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur.

B. Conditions to avoid No specific data.

C. Incompatible materials Hazardous reactions are possible with concentrated mineral acids, strong oxidizing agents, alkali metals and isocyanates.
Reactive or incompatible with the following materials:
combustible materials

D. Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

A. Information on likely routes of exposure

Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Inhalation	Vapour inhalation under ambient conditions is not normally a problem due to low vapour pressure.
Ingestion	Harmful if swallowed. Ethylene glycol: Ingestion of ethylene glycol can cause metabolic acidosis, kidney damage, central nervous system depression, and convulsions. The estimated human lethal dose is approximately 100 ml (3.4 ounces for an adult).
Skin contact	No known significant effects or critical hazards.
Eye contact	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation	May be harmful by inhalation if exposure to vapour, mists or fumes resulting from thermal decomposition products occurs.
Ingestion	Adverse symptoms may include the following: nausea or vomiting reduced foetal weight increase in foetal deaths skeletal malformations
Skin contact	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Eye contact	No specific data.

B. Health hazards

Acute toxicity

Product/ingredient name	Result
Ethylene glycol	**Rat - Oral - LD50** 7712 mg/kg **Mouse - Dermal - LD50** >3500 mg/kg **Rat - Inhalation - LC50 Dusts and mists** >2.5 mg/l [6 hours]

Skin corrosion/irritation

Product/ingredient name	Result
Ethylene glycol	**Rabbit - Skin - Non-irritant to skin.**

Serious eye damage/eye irritation

Product/ingredient name	Result
Ethylene glycol	**Rabbit - Eyes - Non-irritating to the eyes.**

Respiratory corrosion/irritation

Not available.

Respiratory or skin sensitization

Product/ingredient name	Result
Ethylene glycol	**Guinea pig - skin** OECD 406 Result: Not sensitising

CMR - ISHA Article 42 Occupational Exposure Limits

Not available.

Germ cell mutagenicity

Product/ingredient name	Result
Ethylene glycol	**In vitro - Bacteria** Bacterial Reverse Mutation Test Result: Negative **In vitro - Mammal - species unspecified** In vitro Mammalian Chromosomal Aberration Test Result: Negative

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP	ACGIH
Ethylene glycol	-	-	-	A4

Reproductive toxicity

Product/ingredient name	Result
Ethylene glycol	**Rat - Oral** Maternal toxicity: Negative Fertility effects: Negative Developmental: Negative

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Result
Ethylene glycol	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE (kidneys) (oral) - Category 2

Aspiration hazard

Not available.

Section 11. Toxicological information

Potential chronic health effects

Not available.

Conclusion/Summary[Product] Not available.

General May cause damage to organs through prolonged or repeated exposure. (kidney)

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Developmental effects Birth defects and decreased fetal weight have been observed in laboratory animals fed ethylene glycol in large amounts repeatedly during pregnancy.

Fertility effects No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
Castrol Radicool SF Premix	625.8	N/A	N/A	N/A	N/A
Ethylene glycol	500	N/A	N/A	N/A	N/A

Section 12. Ecological information

A. Ecotoxicity

Product/ingredient name	Result
Ethylene glycol	**Acute - EC50** OECD 201 Algae >100 mg/l [72 hours] **Acute - EC50** OECD 202 Daphnia >100 mg/l [48 hours] **Acute - LC50** Fish >1000 mg/l [96 hours] **Chronic - NOEC** OECD 201 Algae >100 mg/l [72 hours]

Other ecological information Miscible in water.

B. Persistence and degradability

Product/ingredient name	Result

Section 12. Ecological information

Ethylene glycol	OECD 301A >90% [10 days] - Readily

C. Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Ethylene glycol	-1.36	-	Low

Bioaccumulative potential This product is not expected to bioaccumulate through food chains in the environment.

D. Mobility in soil

Soil/water partition coefficient Not available.

Mobility Spillages may penetrate the soil causing ground water contamination.

E. Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations

A. Disposal methods The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. Diluted Fluid Diluted fluid should not be discharged into sewage systems unless provided for by local regulations. Dispose under conditions approved by the local authority or via a licensed waste disposal contractor.

B. Disposal precautions This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	IMDG	IATA
A. UN number	Not regulated.	Not regulated.
B. UN proper shipping name	-	-
C. Transport hazard class(es)	-	-
D. Packing group	-	-

Section 14. Transport information

E. Environmental hazards	No.	No.
F. Additional information	-	-

Special precautions for user Not available.

Section 15. Regulatory information

A. Regulation according to ISHA

ISHA article 117 (Harmful substances prohibited from manufacture) None of the components are listed.

ISHA article 118 (Harmful substances requiring permission) None of the components are listed.

Article 2 of Youth Protection Act on Substances Hazardous to Youth Not applicable.

Exposure Limits of Chemical Substances and Physical Factors

The following components have an OEL:
Ethylene glycol

ISHA Enforcement Regs Annex 19 (Exposure standards established for harmful factors) None of the components are listed.

ISHA Enforcement Regs Annex 21 (Harmful factors subject to Work Environment Measurement) The following components are listed: ethylene glycol

ISHA Enforcement Regs Annex 22 (Harmful Factors Subject to Special Health Check-up) The following components are listed: Ethylene glycol

Standard of Industrial Safety and Health Annex 12 (Hazardous substances subject to control) The following components are listed: ethylene glycol

B. Regulation according to Chemicals Control Act

Article 11 (TRI) None of the components are listed.

Article 18 Prohibited (K-Reach Article 27) None of the components are listed.

Article 19 Candidate substances subject to authorization (K-Reach Article 25) None of the components are listed.

Article 19 Subject to authorization (K-Reach Article 25)	None of the components are listed.
Article 20 Toxic Chemicals (K-Reach Article 20)	Not applicable
Article 20 Restricted (K-Reach Article 27)	None of the components are listed.

Article 39 (Accident Precaution Chemicals)

Not listed.

MoE 2021-51 - Regulations on the quantity of toxic substances, restricted substances, prohibited substances and permitted substances

Not listed.

Existing Chemical Substances Subject to Registration	None of the components are listed.

C. Dangerous Materials Safety Management Act	Not regulated.
D. Wastes regulation	Dispose of contents and container in accordance with all local, regional, national and international regulations.

E. Regulation according to other foreign laws

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Regulation according to other foreign laws

Australia inventory (AIIC)	All components are listed or exempted.
Canada inventory	All components are listed or exempted.
China inventory (IECSC)	All components are listed or exempted.
REACH Status	The company, as identified in Section 1, sells this product in the EU in compliance with the current requirements of REACH.
Japan inventory (CSCL)	All components are listed or exempted.
Korea inventory (KECI)	All components are listed or exempted.
Philippines inventory (PICCS)	All components are listed or exempted.
Taiwan inventory (TCSI)	All components are listed or exempted.
United States inventory (TSCA 8b)	All components are active or exempted.

Section 16. Other information

A. References	- Registry of Toxic Effects of Chemical Substances - United States Environmental Protection Agency ECOTOX
B. Date first prepared	08/10/2025
C. Date of issue/Date of revision	10/13/2025
D. Version	1.01
Date of printing	**10/13/2025**
	Product Stewardship

E. Other

Indicates information that has changed from previously issued version.

Key to abbreviations

ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
IMO = International Maritime Organization
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
SGG = Segregation Group
UN = United Nations

Notice to reader

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