



Material Safety Data Sheet

Radi-CAL™ R1

1. Substance/ Preparation Identification & Company

Product Name	Radi-CAL™ R1 Brake Fluid (CP7551-20)	Intended Use	As a hydraulic fluid in automotive brake and clutch systems.
Company	AP Racing Wheler Road Coventry CV3 4LB	Description	Competition brake & fluid
		Telephone	+44 (0) 24 76 639595
		Fax	+44 (0) 24 76 639559
		Email	sales@apracings.co.uk

2. Hazards Identification

Classification	This product is classified as "Irritant" R36: Irritating to eyes.	Health Hazards	Moderately Irritating to eyes. Mildly irritating to skin. When ingested it may be absorbed and cause renal damage at high dosage
Physical Hazards	Product is not classified as flammable but will burn	Environmental Hazards	Low

3. Composition/ Information on Ingredients

General	Blend of polyglycol ethers, glycol ether borate esters and polyglycols with added corrosion and oxidation inhibitors.				
Hazardous Ingredients	Conc. %	CAS	EINECS	Hazard Classification	Risk Phrases
Butyl tri glycol	20-45	143-22-6	205-592-6	Xi	R41
Di ethylene glycol	<25	111-46-6	203-872-2	Xn	R22
Methyl diglycol	<5	111-77-3	203-906-6	Xn	R63

4. First Aid Measures

Skin Contact	Remove contaminated clothing. Wash affected skin with soap and water. If irritation persists seek medical attention.
Eye Contact	Flush eye with water for at least 10 minutes. If irritation persists seek medical attention.
Inhalation	Remove to fresh air. If recovery is not rapid, seek medical attention.
Ingestion	Obtain medical advice immediately. If patient is fully conscious, wash out mouth with water and give plenty of water to drink. Induce vomiting only under medical supervision.
Note to Physicians:	Medical personnel seeking to administer first aid are referred to the services of the Poisons Information Service who can advise in such instances. There is no specific antidote and treatment of over exposure should be directed at control of symptoms and the patient's clinical condition.

5. Fire Fighting Measures

Extinguishing Media	Alcohol resistant foam, dry powder, carbon dioxide or water (fog or fine spray)
Fire Hazards	No special risk – combustion products may contain harmful or irritant fumes
Protective Equipment	In extreme conditions self-contained breathing apparatus should be worn

6. Accidental Release Measures



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Personal Precautions	Avoid contact with eyes, skin, and clothing. When cleaning up large spillages, suitable protective clothing should be worn including eye protection and impervious gloves
Environmental Precautions	Prevent from entering drains, ditches or rivers. If this occurs inform relevant authorities. Prevent gross contamination of soil
Clean Up Methods	Contain spillage using sand or earth. Remove all material to a suitable container for subsequent disposal. Label Salvage Container appropriately. Flush contaminated area with plenty of water

7. Handling & Storage

Handling Storage	No specific handling precautions are necessary. Suitable bulk storage vessels are mild/stainless steel tanks fitted with a dry air breathing system or tight head steel drums. Do not store in lined tanks or drums. Brake fluid absorbs water from the atmosphere - always keep containers tightly closed. Avoid contamination with any other substances and in particular with mineral oils which are incompatible.
Specific Use	Users are referred to the Specification SAE J1707 "Service Maintenance of Brake Fluids".

8. Exposure Controls/ Personal Protection

Exposure Limits	Di ethylene glycol (2, 2' Oxidiethanol) 8h TWA: 23ppm / 101mg/m ³ (EH40) No official WEL figures available for the entire preparation. However, 8 h TWA limits of 100 mg/m ³ vapour or 10 mg/m ³ particulate should be adhered to. Due to the low vapour pressure of the preparation, vapour is not generally a problem at ambient temperature. Handling equipment should minimise the formation of mists.
Engineering Measures	
Skin Protection	Where significant exposure is possible wear impervious body covering. It is recommended that showers are provided at locations where accidental exposure may occur.
Hand Protection	Wear suitable impervious gloves to avoid prolonged or repeated contact. Polyethylene natural or butyl rubber and PVC are suitable materials.
Eye Protection	Wear close-fitting goggles where there is a risk of splashing. Eye baths should be provided at locations where accidental exposure may occur.
Respiratory Protection	No specific precautions at ambient temperature. If fluid is being heated or atomised, use suitable engineering control measures.
Other Protective Equipment	
Environmental Exposure Controls	No special measures required.

9. Physical & Chemical Properties

Description	Blend of polyglycol ethers, glycol ether borate esters and polyglycols with added corrosion and oxidation inhibitors.	
Colour	Clear liquid - colourless to amber (although some grades of brake fluid may be dyed.)	Test Ref Visual
Odour	Bland	N/A
pH	7.0 to 11.5	SAE J 1703
Boiling Point	> 205 °C.	SAE J 1703
Flash Point	> 80 °C.	IP 35



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Auto Ignition Temperature	> 300 °C.	ASTM D 286
Flammability Limits	In Air: Not established	
Density @ 20°C	1.010 – 1.070 g/ml	DIN 51757
Solubility	In water: miscible in any ratio In ethanol: miscible in any ratio	
Melting point	< -50 °C.	SAE J 1703
Partition Coefficient n-Octanol/Water	< 2.0 (all main ingredients)	OECD 117
Viscosity @ 20°C	Approx. 5-10 cSt	ASTM D 445
Vapour pressure@ 20°C	< 2 millibars	Reid
Vapour Density	Not established	
Evaporation Rate	Negligible	

10. Stability & Reactivity

Conditions to Avoid	Product is stable under normal conditions. Glycol Ethers can form peroxides on storage – do not distil to dryness.
Materials to Avoid	Strong oxidising agents. For user safety, brake fluid should never be contaminated with any other substance.
Hazardous Decomposition Products	None known.

11. Toxicological Information (Comments may be based on analogy with similar products)

Skin Contact	Not classified as irritant (Test Method OECD 404) although some sensitive individuals may be affected. Repeated contact may de-fat the skin and cause dermatitis. Product does not contain any known sensitisers. Acute percutaneous toxicity is low LD50 (sk) Rat = > 2000 mg/kg.
Eye Contact	Product is expected to have an irritating effect on the eye (OECD Test Method 405).
Inhalation	Unlikely to be hazardous by inhalation at ambient temperatures due to low vapour pressure. If product is inhaled at elevated temperatures or as an aerosol it may irritate respiratory tract and may cause systemic effects similar to ingestion (see below).
Ingestion	Product is of relatively low acute oral toxicity – however, if any significant amount is ingested there is a risk of renal damage which in extreme cases could lead to kidney failure, coma and death. LD50 (oral) Rat = > 5000 mg/kg. Sparse experience indicates lethal dose in man could be considerably less.
Chronic Toxicity	General – There are no reports of long term adverse affects in man. Carcinogenicity - Not known to be carcinogenic. Mutagenicity - Not known to be mutagenic. Reproductive Toxicity - Major ingredients have not been shown to cause significant fertility or development problems at levels which are not themselves toxic to the animal concerned. One minor ingredient – Methyl diglycol – has been shown to affect foetus development in some studies and is classified as R63 – possible risk of harm to the unborn child.

12. Ecological Information (Comments may be based on analogy with similar products)

Ecotoxicity	Product is of low to medium ecotoxicity
Fish	96h LC50 = > 100 mg/l (Oncorhynchus Mykiss)
Daphnia	48h EC50 = Not Determined but expected to be virtually non toxic.
Algae	72h EC50 = Not Determined but expected to be virtually non



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toxic.

Mobility	Soluble in water and will partition to aqueous phase. Volatilisation from water to air not expected. Mobile in soil until degraded.
Persistence/ Degradability	Product is inherently biodegradable and is expected to be readily biodegradable. OECD 302B (Zahn Wellans/ EMPA) = 100% elimination at 21 days. If admitted into adapted biological water treatment plants, no significant adverse effects on the degrading action of the live sludge are expected.
Bio Accumulative Potential	Not expected to bio accumulate - Log POW for all main ingredients = <2.0

13. Disposal Considerations

Disposal Dangers	Not significant. As for spillages - avoid liquid entering drains, rivers etc.
Disposal Measures	Controlled incineration or recycling is recommended.
Regulations	Dispose of in accordance with local and national regulations. In the E.U. used brake fluids are classified as Hazardous Waste (Directive 91/689/EEC). EWC number: 16.01.13.

14. Transport Information

UN No /Class	None
ADR/RID	Not classified
IMO/IMDG	Not classified as hazardous
Marine Pollutant	No
IATA/IACO Class	Not classified

15. Regulatory Information

E.U. Classification	Xi – Irritant
Risk Phrases	R36 - Irritating to eyes.
Safety Phrases	S2 - Keep out of reach of children. S26 (Modified) - In case of contact with eyes, rinse immediately with water for 10 minutes. If irritation persists seek medical advice. S46 - If swallowed seek medical advice immediately and show this document or label.
Restrictions on Use or Exposure	To be in accord with local and national regulations. In the U.K. this would include the HASAWA and COSHH.

16. Other Information

Risk (R) Phrases	R22 – Harmful if swallowed. R41 – Risk of serious damage to eyes. R63 – Possible risk of harm to the unborn child.
Legal Disclaimer	The information contained herein is based on the present knowledge held by AP Racing and does not constitute the users own assessment of work place risk and substance use as required by other Health and Safety legislation.