

Product information

Brake Fluid DOT 4



Description

Synthetic brake fluid based on glycol ethers, alkyl polyglycols and glycol ether esters. It contains inhibitors to prevent the corrosion of metallic brake components and to reduce oxidation at increased temperatures. Specially developed to extend the operating life of components in the hydraulic brake and clutch systems of motor vehicles. The brake fluid has a high wet and dry boiling point, thus ensuring safe braking even after the absorption of some moisture over an extended period of use. Special moisture scavengers help to prevent against the formation of steam bubbles.

Properties

- miscible and compatible with high-quality synthetic brake fluids
- outstanding protection against the formation of steam bubbles
- excellent elastomer compatibility
- assures a high degree of lubricating action on all moving components in the hydraulic brake circuit
- extremely high wet and dry boiling points
- excellent viscosity/temperature properties
- excellent low temperature behavior
- highest thermal stability

Approvals

FMVSS 116 DOT 3 • FMVSS 116 DOT 4 • ISO 4925 Class 3 • ISO 4925 Class 4 • SAE J 1703 • SAE J 1704

Technical data

ERBP, wet	> 155 °C ISO 4925.6.1
Color / appearance	amber, colourless
pH value	7-11,5 SAE J 1703
ERBP	> 260 °C ISO 4925.6.1
Density at 20 °C	1,01-1,07 g/ml
Flash point	100 °C
Odor	mild
Shelf life in original sealed container	24 Monate

Areas of application

Exceptionally well-suited for use with all disk and drum brake systems, as well as vehicle clutch systems for which a synthetic brake fluid of this specification is prescribed. The brake fluid is also suitable for use in ABS brake systems.



Note:

Note the vehicle manufacturer's specifications!

Application

Can be used with all conventional brake fluid bleeding devices. Miscible and compatible with high-quality synthetic brake fluids. The optimal period of use for this brake fluid is, however, only ensured when it is used alone. It is recommended that the brake fluid be changed in accordance with the specifications from the vehicle manufacturer.

Caution: Brake fluid corrodes the paintwork of cars; in the event of spillage, rinse immediately with plenty of water. Do not use in mineral oil-based central hydraulic systems. Note the vehicle manufacturer's instructions.

Available pack sizes

250 ml Canister plastic	2884 DK-FIN-N-S
250 ml Canister plastic	3091 GB-ARAB
250 ml Canister plastic	21155 D-GB
500 ml Canister plastic	20703 D-GB-CN
500 ml Canister plastic	2885 DK-FIN-N-S
500 ml Canister plastic	3093 GB-E
500 ml Canister plastic	21156 D-GB
500 ml Canister plastic	21306 GB
1 l Canister plastic	2886 DK-FIN-N-S
1 l Canister plastic	21157 D-GB
5 l Canister plastic	2887 DK-FIN-N-S
5 l Canister plastic	21158 D-GB

Product information

Brake Fluid DOT 4



Available pack sizes

20 l Canister plastic 21159
D-GB-I-E-P

Our information is based on thorough research and may be considered reliable, although not legally binding.

20152 BRAKE FLUID DOT4 250ml

Liqui Moly GmbH

Chemwatch Hazard Alert Code: 2

Chemwatch: 82-9245

Version No: 4.1.1.1

Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

SECTION 1 IDENTIFICATION

Product Identifier

Product name	20152 BRAKE FLUID DOT4 250ml
Synonyms	Not Available
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	Hydraulic fluid. Use according to manufacturer's directions.
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Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	Liqui Moly GmbH

Emergency phone number

Association / Organisation	INFOTRAC

SECTION 2 HAZARD(S) IDENTIFICATION

Classification of the substance or mixture

CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	1	1
Toxicity	1	1
Body Contact	2	2
Reactivity	1	1
Chronic	0	0

NFPA 704 diamond




0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Eye Irritation Category 2A, Reproductive Toxicity Category 2
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Label elements

Hazard pictogram(s)	
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SIGNAL WORD	WARNING
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Hazard statement(s)

H319	Causes serious eye irritation.
H361	Suspected of damaging fertility or the unborn child.

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P281	Use personal protective equipment as required.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/attention.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.

Precautionary statement(s) Storage

P405	Store locked up.
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Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS**Substances**

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
143-22-6	30-40	triethylene glycol monobutyl ether
111-46-6	1-10	diethylene glycol
1559-34-8	1-10	tetraethylene glycol monobutyl ether
112-34-5	1-5	diethylene glycol monobutyl ether
111-77-3	0.1-<1	diethylene glycol monomethyl ether

SECTION 4 FIRST-AID MEASURES**Description of first aid measures**

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> ▶ Wash out immediately with fresh running water. ▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▶ Seek medical attention without delay; if pain persists or recurs seek medical attention. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> ▶ Immediately remove all contaminated clothing, including footwear. ▶ Flush skin and hair with running water (and soap if available). ▶ Seek medical attention in event of irritation.
Inhalation	<ul style="list-style-type: none"> ▶ If fumes or combustion products are inhaled remove from contaminated area. ▶ Lay patient down. Keep warm and rested. ▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▶ Transport to hospital, or doctor.
Ingestion	<ul style="list-style-type: none"> ▶ If swallowed do NOT induce vomiting. ▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▶ Observe the patient carefully. ▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▶ Seek medical advice.

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

To treat poisoning by the higher aliphatic alcohols (up to C7):

- ▶ Gastric lavage with copious amounts of water.
- ▶ It may be beneficial to instill 60 ml of mineral oil into the stomach.
- ▶ Oxygen and artificial respiration as needed.
- ▶ Electrolyte balance: it may be useful to start 500 ml. M/6 sodium bicarbonate intravenously but maintain a cautious and conservative attitude toward electrolyte replacement unless shock or severe acidosis threatens.
- ▶ To protect the liver, maintain carbohydrate intake by intravenous infusions of glucose.
- ▶ Haemodialysis if coma is deep and persistent. [GOSSELIN, SMITH HODGE: Clinical Toxicology of Commercial Products, Ed 5]

BASIC TREATMENT

- ▶ Establish a patent airway with suction where necessary.
- ▶ Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- ▶ Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- ▶ Monitor and treat, where necessary, for shock.
- ▶ Monitor and treat, where necessary, for pulmonary oedema.
- ▶ Anticipate and treat, where necessary, for seizures.
- ▶ **DO NOT use emetics.** Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
- ▶ Give activated charcoal.

ADVANCED TREATMENT

- ▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ▶ Positive-pressure ventilation using a bag-valve mask might be of use.
- ▶ Monitor and treat, where necessary, for arrhythmias.
- ▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ▶ If the patient is hypoglycaemic (decreased or loss of consciousness, tachycardia, pallor, dilated pupils, diaphoresis and/or dextrose strip or glucometer readings below 50 mg), give 50% dextrose.
- ▶ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- ▶ Drug therapy should be considered for pulmonary oedema.
- ▶ Treat seizures with diazepam.
- ▶ Proparacaine hydrochloride should be used to assist eye irrigation.

EMERGENCY DEPARTMENT

- ▶ Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.
- ▶ Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
- ▶ Acidosis may respond to hyperventilation and bicarbonate therapy.
- ▶ Haemodialysis might be considered in patients with severe intoxication.
- ▶ Consult a toxicologist as necessary. BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

For C8 alcohols and above.

Symptomatic and supportive therapy is advised in managing patients.

SECTION 5 FIRE-FIGHTING MEASURES

Extinguishing media

- ▶ Alcohol stable foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility	▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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Special protective equipment and precautions for fire-fighters

Fire Fighting	<ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear full body protective clothing with breathing apparatus. ▶ Prevent, by any means available, spillage from entering drains or water course. ▶ Use water delivered as a fine spray to control fire and cool adjacent area.
Fire/Explosion Hazard	<ul style="list-style-type: none"> ▶ Combustible. ▶ Slight fire hazard when exposed to heat or flame. ▶ Heating may cause expansion or decomposition leading to violent rupture of containers. ▶ On combustion, may emit toxic fumes of carbon monoxide (CO). <p>Combustion products include: carbon dioxide (CO₂) other pyrolysis products typical of burning organic material. May emit poisonous fumes. May emit corrosive fumes.</p>

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ▶ Remove all ignition sources. ▶ Clean up all spills immediately. ▶ Avoid breathing vapours and contact with skin and eyes. ▶ Control personal contact with the substance, by using protective equipment.
Major Spills	<p>Moderate hazard.</p> <ul style="list-style-type: none"> ▶ Clear area of personnel and move upwind. ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	<ul style="list-style-type: none"> ▶ Avoid all personal contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs. ▶ Use in a well-ventilated area. ▶ Prevent concentration in hollows and sumps. ▶ DO NOT allow clothing wet with material to stay in contact with skin
Other information	<ul style="list-style-type: none"> ▶ Store in original containers. ▶ Keep containers securely sealed. ▶ No smoking, naked lights or ignition sources. ▶ Store in a cool, dry, well-ventilated area.

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ DO NOT use aluminium or galvanised containers ▶ Metal can or drum ▶ Packaging as recommended by manufacturer. ▶ Check all containers are clearly labelled and free from leaks.
Storage incompatibility	<ul style="list-style-type: none"> ▶ Avoid reaction with oxidising agents

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US ACGIH Threshold Limit Values (TLV)	diethylene glycol monobutyl ether	Diethylene glycol monobutyl ether	10 ppm	Not Available	Not Available	TLV® Basis: Hematologic, liver & kidney eff

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
diethylene glycol	Diethylene glycol	6.9 ppm	140 ppm	860 ppm
diethylene glycol monobutyl ether	Butoxyethoxy)ethanol, 2-(2-; (Diethylene glycol monobutyl ether)	30 ppm	33 ppm	200 ppm
diethylene glycol monomethyl ether	Methoxyethoxy)ethanol, 2-(2-; (Diethylene glycol monomethyl ether)	3.4 ppm	37 ppm	220 ppm

Ingredient	Original IDLH	Revised IDLH
triethylene glycol monobutyl ether	Not Available	Not Available
diethylene glycol	Not Available	Not Available
tetraethylene glycol monobutyl ether	Not Available	Not Available
diethylene glycol monobutyl ether	Not Available	Not Available
diethylene glycol monomethyl ether	Not Available	Not Available

OCCUPATIONAL EXPOSURE BANDING

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
diethylene glycol	E	≤ 0.1 ppm
tetraethylene glycol monobutyl ether	E	≤ 0.1 ppm
diethylene glycol monomethyl ether	E	≤ 0.1 ppm


Notes:

Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

Exposure controls

Appropriate engineering controls	<p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.</p>
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20152 BRAKE FLUID DOT4 250ml

Personal protection	
Eye and face protection	<ul style="list-style-type: none"> ▶ Safety glasses with side shields. ▶ Chemical goggles. ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.
Skin protection	See Hand protection below
Hands/feet protection	<ul style="list-style-type: none"> ▶ Wear chemical protective gloves, e.g. PVC. ▶ Wear safety footwear or safety gumboots, e.g. Rubber <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care.</p>
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> ▶ Overalls. ▶ P.V.C. apron. ▶ Barrier cream.

Recommended material(s)**GLOVE SELECTION INDEX**

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

20152 BRAKE FLUID DOT4 250ml

Material	CPI
BUTYL	A
NITRILE	B
NEOPRENE	C
PVC	C

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Respiratory protection

Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	A-AUS P2	-	A-PAPR-AUS / Class 1 P2
up to 50 x ES	-	A-AUS / Class 1 P2	-
up to 100 x ES	-	A-2 P2	A-PAPR-2 P2 ^

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO₂), G = Agricultural chemicals, K = Ammonia(NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**Information on basic physical and chemical properties**

Appearance	Colourless, amber, clear liquid with mild odour; miscible with water.		
Physical state	Liquid	Relative density (Water = 1)	1.02-1.07
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	>300
pH (as supplied)	7	Decomposition temperature	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	5-10
Initial boiling point and boiling range (°C)	>260	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	>100	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available

20152 BRAKE FLUID DOT4 250ml

Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	<0	Gas group	Not Available
Solubility in water	Miscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual. Inhalation hazard is increased at higher temperatures.
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual.
Skin Contact	Skin contact with the material may damage the health of the individual; systemic effects may result following absorption. There is some evidence to suggest that the material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering. Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	There is evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Severe inflammation may be expected with pain.
Chronic	Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

20152 BRAKE FLUID DOT4 250ml	TOXICITY	IRRITATION
	Not Available	Not Available
triethylene glycol monobutyl ether	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg ^[2]	Eye (rabbit): 20 mg/24h - moderate
	Oral (rat) LD50: 5300 mg/kg ^[2]	Eye (rabbit): 50 mg - SEVERE
		Eye: adverse effect observed (irritating) ^[1]
		Skin (rabbit):10 mg/24h(open)mild
		Skin (rabbit):500 mg/24h - mild
	Skin: no adverse effect observed (not irritating) ^[1]	
diethylene glycol	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 11890 mg/kg ^[2]	Eye (rabbit) 50 mg mild
	Oral (rat) LD50: 12000 mg/kg ^[2]	Eye: no adverse effect observed (not irritating) ^[1]
		Skin (human): 112 mg/3d-I mild
	Skin (rabbit): 500 mg mild	
	Skin: no adverse effect observed (not irritating) ^[1]	
tetraethylene glycol monobutyl ether	TOXICITY	IRRITATION
	Not Available	Eye: adverse effect observed (irritating) ^[1]
		Skin: no adverse effect observed (not irritating) ^[1]
diethylene glycol monobutyl ether	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg ^[2]	Eye (rabbit): 20 mg/24h moderate
	Oral (rat) LD50: =4500 mg/kg ^[2]	Eye (rabbit): 5 mg - SEVERE
diethylene glycol monomethyl ether	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 2525 mg/kg ^[2]	Eye (rabbit): 500 mg moderate

20152 BRAKE FLUID DOT4 250ml

	Oral (rat) LD50: 4040 mg/kg ^[2]	Eye (rabbit): 500 mg/24h mild
		Eye: no adverse effect observed (not irritating) ^[1]
		Skin: no adverse effect observed (not irritating) ^[1]

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

20152 BRAKE FLUID DOT4 250ml	Test-OECD 405 (Acute eye irritation/corrosion) - Eye irrit.2
DIETHYLENE GLYCOL	Diglycolic acid is formed following the oxidation of accidentally ingested diethylene glycol in the body and can lead to severe complications with fatal outcome.
TETRAETHYLENE GLYCOL MONOBUTYL ETHER	No significant acute toxicological data identified in literature search.
DIETHYLENE GLYCOL MONOMETHYL ETHER	The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
TRIETHYLENE GLYCOL MONOBUTYL ETHER & DIETHYLENE GLYCOL MONOBUTYL ETHER	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
TRIETHYLENE GLYCOL MONOBUTYL ETHER & DIETHYLENE GLYCOL	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
TRIETHYLENE GLYCOL MONOBUTYL ETHER & TETRAETHYLENE GLYCOL MONOBUTYL ETHER	Tri-ethylene glycol ethers undergo enzymatic oxidation to toxic alkoxy acids. They may irritate the skin and the eyes. At high oral doses, they may cause depressed reflexes, flaccid muscle tone, breathing difficulty and coma. Death may result in experimental animal.
DIETHYLENE GLYCOL MONOBUTYL ETHER & DIETHYLENE GLYCOL MONOMETHYL ETHER	This category includes diethylene glycol ethyl ether (DGEE), diethylene glycol propyl ether (DGPE) diethylene glycol butyl ether (DGBE) and diethylene glycol hexyl ether (DGHE) and their acetates. Studies show that they can cause kidney and liver damage, skin and eye irritation as well as blood changes but do not cause damage to the reproductive, genetic and developmental abnormalities, sensitisation or respiratory systems. However, DGEE is reported to cause sperm insufficiency.

Acute Toxicity	✗	Carcinogenicity	✗
Skin Irritation/Corrosion	✗	Reproductivity	✓
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✗
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✗
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
 ✓ – Data available to make classification

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

20152 BRAKE FLUID DOT4 250ml	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available

triethylene glycol monobutyl ether	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	2-400mg/L	2
	EC50	48	Crustacea	2-705mg/L	2
	EC50	72	Algae or other aquatic plants	1-589mg/L	2
	EC0	24	Crustacea	1-989.5mg/L	2
	NOEC	96	Fish	1-mg/L	2

diethylene glycol	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	66-mg/L	2
	EC50	48	Crustacea	=84000mg/L	1
	EC50	96	Algae or other aquatic plants	9-362mg/L	2
	NOEC	552	Crustacea	>=1-mg/L	2

tetraethylene glycol monobutyl ether	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	EC50	48	Crustacea	>3-200mg/L	2
	EC50	72	Algae or other aquatic plants	1-101mg/L	2
	NOEC	48	Crustacea	1-800mg/L	2

diethylene glycol monobutyl ether	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	1-300mg/L	2

20152 BRAKE FLUID DOT4 250ml

	EC50	48	Crustacea	4-950mg/L	2
	EC50	72	Algae or other aquatic plants	1-101mg/L	2
	NOEC	96	Algae or other aquatic plants	>=100mg/L	1
diethylene glycol monomethyl ether	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	5-741mg/L	2
	EC50	48	Crustacea	1-192mg/L	2
	EC50	96	Algae or other aquatic plants	>1-mg/L	2
	EC0	96	Algae or other aquatic plants	1-mg/L	2
Legend:	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
triethylene glycol monobutyl ether	LOW	LOW
diethylene glycol	LOW	LOW
tetraethylene glycol monobutyl ether	LOW	LOW
diethylene glycol monobutyl ether	LOW	LOW
diethylene glycol monomethyl ether	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
triethylene glycol monobutyl ether	LOW (LogKOW = 0.0178)
diethylene glycol	LOW (BCF = 180)
tetraethylene glycol monobutyl ether	LOW (LogKOW = -0.2566)
diethylene glycol monobutyl ether	LOW (BCF = 0.46)
diethylene glycol monomethyl ether	LOW (BCF = 0.18)

Mobility in soil

Ingredient	Mobility
triethylene glycol monobutyl ether	LOW (KOC = 10)
diethylene glycol	HIGH (KOC = 1)
tetraethylene glycol monobutyl ether	LOW (KOC = 10)
diethylene glycol monobutyl ether	LOW (KOC = 10)
diethylene glycol monomethyl ether	HIGH (KOC = 1)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ DO NOT allow wash water from cleaning or process equipment to enter drains. ▶ It may be necessary to collect all wash water for treatment before disposal. ▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▶ Where in doubt contact the responsible authority. ▶ Recycle wherever possible or consult manufacturer for recycling options. ▶ Consult State Land Waste Authority for disposal. ▶ Bury or incinerate residue at an approved site. ▶ Recycle containers if possible, or dispose of in an authorised landfill.
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SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO
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Land transport (DOT): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

TRIETHYLENE GLYCOL MONOBUTYL ETHER IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles	US Clean Air Act - Hazardous Air Pollutants
IMO IBC Code Chapter 17: Summary of minimum requirements	US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk	US EPCRA Section 313 Chemical List
IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
IMO Provisional Categorization of Liquid Substances - List 2: Pollutant only mixtures containing at least 99% by weight of components already assessed by IMO	US TSCA Chemical Substance Inventory - Interim List of Active Substances
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)	US TSCA Section 4/12 (b) - Sunset Dates/Status

DIETHYLENE GLYCOL IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles	US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
IMO IBC Code Chapter 17: Summary of minimum requirements	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
IMO IBC Code Chapter 18: List of products to which the Code does not apply	US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL)
IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances	US TSCA Chemical Substance Inventory - Interim List of Active Substances
US DOE Temporary Emergency Exposure Limits (TEELs)	

TETRAETHYLENE GLYCOL MONOBUTYL ETHER IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles	US Clean Air Act - Hazardous Air Pollutants
IMO IBC Code Chapter 17: Summary of minimum requirements	US EPCRA Section 313 Chemical List
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
IMO Provisional Categorization of Liquid Substances - List 2: Pollutant only mixtures containing at least 99% by weight of components already assessed by IMO	US TSCA Chemical Substance Inventory - Interim List of Active Substances
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)	

DIETHYLENE GLYCOL MONOBUTYL ETHER IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles	US Clean Air Act - Hazardous Air Pollutants
IMO IBC Code Chapter 17: Summary of minimum requirements	US DOE Temporary Emergency Exposure Limits (TEELs)
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk	US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances	US EPCRA Section 313 Chemical List
IMO Provisional Categorization of Liquid Substances - List 2: Pollutant only mixtures containing at least 99% by weight of components already assessed by IMO	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)	US TSCA Chemical Substance Inventory - Interim List of Active Substances
US ACGIH Threshold Limit Values (TLV)	US TSCA Section 4/12 (b) - Sunset Dates/Status
US AIHA Workplace Environmental Exposure Levels (WEELs)	

DIETHYLENE GLYCOL MONOMETHYL ETHER IS FOUND ON THE FOLLOWING REGULATORY LISTS

Chemical Footprint Project - Chemicals of High Concern List	US Clean Air Act - Hazardous Air Pollutants
GESAMP/EHS Composite List - GESAMP Hazard Profiles	US DOE Temporary Emergency Exposure Limits (TEELs)
IMO IBC Code Chapter 17: Summary of minimum requirements	US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk	US EPCRA Section 313 Chemical List
IMO Provisional Categorization of Liquid Substances - List 2: Pollutant only mixtures containing at least 99% by weight of components already assessed by IMO	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)	US TSCA Chemical Substance Inventory - Interim List of Active Substances

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SECTION 311/312 HAZARD CATEGORIES

Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	No
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No

Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	No
Acute toxicity (any route of exposure)	No
Reproductive toxicity	Yes
Skin Corrosion or Irritation	No
Respiratory or Skin Sensitization	No
Serious eye damage or eye irritation	Yes
Specific target organ toxicity (single or repeated exposure)	No
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	No
Hazards Not Otherwise Classified	No

US. EPA CERCLA HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES (40 CFR 302.4)

None Reported

State Regulations**US. CALIFORNIA PROPOSITION 65**

None Reported

National Inventory Status

National Inventory	Status
Australia - AICS	Yes
Canada - DSL	Yes
Canada - NDSL	No (diethylene glycol monomethyl ether; diethylene glycol; diethylene glycol monobutyl ether; tetraethylene glycol monobutyl ether; triethylene glycol monobutyl ether)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	No (tetraethylene glycol monobutyl ether; triethylene glycol monobutyl ether)
Vietnam - NCI	Yes
Russia - ARIPS	No (tetraethylene glycol monobutyl ether)
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Revision Date	01/11/2019
Initial Date	18/07/2017

SDS Version Summary

Version	Issue Date	Sections Updated
3.1.1.1	21/03/2018	Acute Health (eye), Acute Health (inhaled), Acute Health (skin), Advice to Doctor, Chronic Health, Classification, Disposal, Engineering Control, Fire Fighter (extinguishing media), First Aid (eye), First Aid (inhaled), Handling Procedure, Spills (major), Storage (storage incompatibility), Toxicity and Irritation (Other)
4.1.1.1	01/11/2019	One-off system update. NOTE: This may or may not change the GHS classification

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit,
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

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