Orthene Chemicals Limited
Brember Road, Harrow,
Middx. U.K.
HA2 8UJ
Telephone: 44 (0)20 8864 4414
Fax 44 (0)20 8872 8799

MSDS 14: Issue 6 Issue Date: 28th May 2015

SAFETY DATA SHEET

According to EC Regulation 453-2010

Section 1: Identification of the substance / mixture and of the company / undertaking.

1.1 Product Identifier

Trade Name: Brembo hydraulic brake fluid "LCF 600 PLUS"

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified Uses: Hydraulic fluid for use in automotive brake and clutch systems.

1.3 Details of the supplier of the MSDS:

Orthene Chemicals Ltd. Brember Road, Harrow, Middlesex, HA2 8UJ, UK.
Tel Number +44 (0)20 8864 4414 E mail: technical@orthene.co.uk

1.4 Emergency Telephone Number

+44 (0)20 8864 4414. Hours 07:00–17:00 Mon –Fri GMT (Recorded emergency message out of hours).
Alternatively in the UK dial 111 for the medical emergency services.
For contact details of Poisons Centres in other countries, see the World Health Organisation webpage http://www.who.int/gho/phe/chemical_safety/poisons_centres/en/ from which a directory of Poisons Centres in various member states can be downloaded.

Section 2: Hazards identification

2.1Classification of the substance or mixture

Classification according to regulation 1272/2008 (CLP/GHS):. Not classified.

2.2 Label Elements

Labelling according to 1272/2008 (CLP/GHS)
Hazard Pictogram/s; None

Signal word: Not applicable

Hazard phrases; None
Precautionary phrases recommended; P102 -keep out of the reach of children. P305/P351/P338 –If in eyes rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. P337/313 –If eye irritation persists, get medical advice. P301/311 –If swallowed, call a poison centre or doctor/physician and have container or label at hand.

2.3 Other Hazards

Product is not classified as flammable or combustible but will burn.
Product is not classified as PBT or vPvB according to Annex XIII.

Section 3: Composition/information on ingredients

3.1 Substances
Not applicable.

3.2 Mixtures
General description**.** Blend of polyglycol ethers, glycol ether esters and polyglycols with added corrosion and oxidation inhibitors.

Hazardous Ingredients

Ingredient	EC No.	CAS No.	Registration No.	% w/w	Classification 1272 / 2008
Butyl triglycol	205-592-6	143-22-6	01-2119531322-53	0-20	Eye Damage –Cat 1; H318
Diethylene glycol	203-872-2	111-46-6	01-2119457857-21	0-10	Acute Oral Toxicity Cat 4 –H302. STOT-RE Cat 2 –H373.
Methyl diglycol	203-906-6	111-77-3	01-2119475100-52	<3	Reproductive toxicity-Cat 2; H361d
Butyl diglycol	203-961-6	112-34-5	01-2119475104-44	<3	Eye Irritant –Cat 2 H 319

See Section 16 for explanation of the classification codes.

Section 4: First aid measures

4.1 Description of first aid measures
General Advice - First Aid responders should pay attention to self-protection and use any recommended protective clothing –see section 8.
Inhalation -remove victim to fresh air –and keep at rest. If recovery is not rapid, seek medical attention.
Skin contact-remove contaminated clothing. Wash affected skin with soap and water. If irritation persists seek medical attention.
Eye contact - Flush eye with plenty of water for at least 10 minutes. If irritation persists 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. Never give anything by mouth to an unconscious person. Induce vomiting only under medical supervision.

4.2 Most important symptoms and effects both acute and delayed.
The most important symptoms and effects are described in sections 2 and 11.

4.3 Indication of any immediate medical attention and special treatment needed.
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.

Section 5: Fire fighting measures

5.1 Extinguishing Media
Suitable extinguishing media -Alcohol resistant foam, dry powder, carbon dioxide or water (fog or fine spray).
Unsuitable Extinguishing Media - Water jets (although these may be used to cool adjacent containers).

5.2 Special hazards arising from the substance or mixture.
No special risk – combustion products may contain harmful or irritant fumes. Containers may rupture from gas generation if exposed to fire.

5.3 Advice for fire fighters
Eye protection should be worn. Keep containers cool with water spray. In extreme conditions self-contained breathing apparatus and protective suit should be worn.

Section 6: Accidental release measures

6.1 Personal Precautions, protective equipment and emergency procedures.
Prevent unnecessary personnel entering area of spillage. Avoid contact with eyes, skin, and clothing. When cleaning up large spills, appropriate protective clothing should be worn including eye protection and impervious gloves -see section 8 for details.

6.2 Environmental Precautions
Prevent from entering drains, ditches or rivers. If this happens inform relevant authorities. Prevent gross contamination of soil.

6.3 Methods and materials for containment and cleaning up.
Contain spillage using sand earth or absorbent booms. Small spillages can be absorbed using rags or absorbent granules. Remove all material to a suitable container for subsequent disposal. Label Salvage Container appropriately. Flush contaminated area with plenty of water.

6.4 References to other sections
For personal protection see section 8. For disposal methods see section 13.

Section 7: Handling and storage.

7.1 Precautions for safe handling
Avoid any method of handling that generates mists or aerosols. Do not eat, drink or smoke when handling this product. Wash hands thoroughly after use.

7.2 Conditions for safe storage including any incompatibilities
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.

7.3 Specific end use
Users are referred to the Specification SAE J1707 “Service Maintenance of Brake Fluids”

Section 8: Exposure controls / personal protection

8.1 Control Parameters

8.1.1 Occupational exposure limits
Mixture – No official figures available. Due to the low vapour pressure of the preparation, vapour is not generally a problem at ambient temperature.
Individual ingredients.

	Country	8 hours	15 min
Diethylene glycol	Australia	23 ppm / 101 mg/m3	
	Austria	10 ppm / 44 mg/m3	40ppm / 176 mg/m3
	Denmark	2.5 ppm / 11 mg/m3	5ppm / 22 mg/m3
	Germany	10 ppm / 44 mg/m3	40 ppm / 176 mg/m3
	Latvia	10 mg/m3	
	New Zealand	23 ppm / 101 mg/m3	
	Sweden	10 ppm / 45 mg/m3	20ppm / 90 mg/m3
	Switzerland	10 ppm / 44 mg/m3	40ppm / 176 mg/m3
	UK	23 ppm / 101 mg/m3	
Butyl diglycol	Austria	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3
	Belgium	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3
	Denmark	100 mg/m3	200 mg/m3
	EU	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3
	France	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3
	Germany	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3
	Hungary	67.5 mg/m3	101.2 mg/m3
	Italy	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3

	Latvia	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3
	Poland	67.5 mg/m3	100 mg/m3
	Spain	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3
	Sweden	15 ppm / 100 mg/m3	30ppm / 200 mg/m3
	Switzerland	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3
	The Netherlands	50 mg/m3	100 mg/m3
	UK	10 ppm / 67.5 mg/m3	15ppm / 101.2 mg/m3
Methyl diglycol	Austria	10 ppm / 50.1 mg/m3	
	Belgium	10 ppm / 50.1 mg/m3	
	Denmark	25 ppm (provisional)	
	EU	10 ppm / 50.1 mg/m3	
	France	10 ppm / 50.1 mg/m3	
	Germany	10 ppm / 50.1 mg/m3	
	Hungary	50.1 mg/m3	
	Italy	10 ppm / 50.1 mg/m3	
	Latvia	20 ppm / 100 mg/m3	
	Poland	50.0 mg/m3	
	Spain	10 ppm / 50.1 mg/m3	
	The Netherlands	45 mg/m3	
	UK	10 ppm / 50.1 mg/m3	

8.1.2 Derived No Effect Levels (DNEL)

Butyl Triglycol

Worker; Long term exposure –systemic effects, dermal	50mg/kg/day
Worker; Long term exposure –systemic effects, inhalation	195mg/ m3
Consumer Long term exposure –systemic effects, dermal	25mg/kg/day
Consumer Long term exposure –systemic effects, inhalation	117mg/ m3
Consumer Long term exposure –systemic effects, oral	2.5mg/kg/day

Butyl Diglycol

Worker; Short term exposure –local effects, inhalation	101.2mg/ m3
Worker; Long term exposure –systemic effects, dermal	20mg/kg/day
Worker; Long term exposure –systemic effects, inhalation	67mg/ m3
Consumer; Short term exposure –local effects, inhalation	50.6mg/ m3
Consumer Long term exposure –systemic effects, dermal	10mg/kg/day
Consumer Long term exposure –systemic effects, inhalation	34mg/ m3
Consumer Long term exposure –systemic effects, oral	1.25mg/kg/day

Diethylene glycol

Worker; Long term exposure –systemic effects, dermal	106mg/kg/day
Worker; Long term exposure –systemic effects, inhalation	60mg/ m3
Consumer Long term exposure –systemic effects, dermal	53mg/kg/day
Consumer Long term exposure –systemic effects, inhalation	12mg/ m3

Methyl Diglycol

Worker; Long term exposure –systemic effects, dermal	0.53mg/kg/day
Worker; Long term exposure –systemic effects, inhalation	50.1mg/ m3
Consumer Long term exposure –systemic effects, dermal	0.27mg/kg/day
Consumer Long term exposure –systemic effects, inhalation	25mg/ m3
Consumer Long term exposure –systemic effects, oral	1.5mg/kg/day

8.1.3 Predicted No Effect Concentrations (PNEC)

Butyl Triglycol

Aqua (freshwater)	1.5 mg/L
Aqua (marine water)	0.25 mg/L
Aqua (intermittent releases)	5.0 mg/L
Sewage Treatment Plant (STP)	200 mg/ L
Sediment (freshwater)	5.77 mg/kg/sediment dw
Sediment (marine water)	0.13 mg/kg/sediment dw

Soil	0.45 mg/kg/soil dw
Oral	111 mg/kg/food

Butyl Diglycol

Aqua (freshwater)	1.0 mg/L
Aqua (marine water)	0.1 mg/L
Aqua (intermittent releases)	3.9 mg/L
Sewage Treatment Plant (STP)	200mg/ L
Sediment (freshwater)	4.0 mg/kg/sediment dw
Sediment (marine water)	0.4 mg/kg/sediment dw
Soil	0.4 mg/kg/soil dw
Oral	56 mg/kg/food.

Diethylene glycol

Aqua (freshwater)	10 mg/L
Aqua (marine water)	1 mg/L
Aqua (intermittent releases)	10 mg/L
Sewage Treatment Plant (STP)	199.5 mg/ L
Sediment (freshwater)	20.9 mg/kg/sediment dw
Soil	1.53 mg/kg/soil dw

Methyl Diglycol

Aqua (freshwater)	12 mg/L
Aqua (marine water)	1.2 mg/L
Aqua (intermittent releases)	12 mg/L
Sewage Treatment Plant (STP)	10000 mg/ L
Sediment (freshwater)	44.4 mg/kg/sediment dw
Sediment (marine water)	0.44 mg/kg/sediment dw
Soil	2.44 mg/kg/soil dw
Oral	0.9 mg/kg/food

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8.1.4 Recommended monitoring techniques
Personal air monitoring. An applicable standard is BS EN 14042.

8.2 Exposure Controls

8.2.1 General
Employ good industrial hygiene practice as part of a control banding approach.

8.2.2 Appropriate engineering controls
Not necessary under normal conditions. If fluid is being heated or atomised, local exhaust ventilation with filter / scrubber is recommended.

8.2.3 Individual protection measures / personal protective equipment.
Respiratory Protection –Not needed under normal conditions. Self contained breathing apparatus or Organic vapour respirators (A-P2) may be used where product is being heated or atomised and engineering control measures are not practical.
Hand Protection -Wear chemically resistant impervious gloves (EN 374) to avoid prolonged or repeated contact. Butyl rubber, Natural rubber, Nitrile rubber and PVC are suitable materials. Because of great variety of types of gloves see manufacturer's figures for breakthrough times. In the case of prolonged contact a glove with a protection class of 6 (breakthrough time of >480 min) is recommended.
Eye Protection -Wear close-fitting goggles (EN 166) or face shield where there is a risk of splashing (acrylic or PVC preferred to polycarbonate which may be attacked by brake fluid). Eye baths should be provided at locations where accidental exposure may occur.
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.

8.2.4 Environmental Exposure Controls
No special measures required.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

		Test method
Appearance	Clear liquid - colourless to amber (although some brake fluids may be dyed).	Visual.
Odour	Bland	N/A
Odour threshold	N/A –very low odour	
pH	7.0 to 11.50	SAE J 1703
Melting point	< -50 °.C.	SAE J 1703
Boiling point	> 260 °.C.	SAE J 1703
Flash point	> 120 °.C.	IP 35
Flammability limits in air.	Not established as non-volatile	
Auto ignition temp.	> 300°C.	ASTM D 286
Decomposition Temperature	>300°C	
Evaporation Rate	Negligible	
Density @ 20°C	1.030 – 1.090 g/ml	DIN 51757
Solubility	In water: miscible in any ratio In ethanol: miscible in any ratio	
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 milibars	Reid
Vapour Density	Not established as non-volatile	
Explosive properties	Not explosive.	
Oxidising Properties	Not oxidising	

9.2 Other information
No other relevant data.

Section 10: Stability and reactivity

10.1 Reactivity
No hazardous reactions if stored and handled as indicated**.**

10.2 Chemical Stability
Product is stable under normal conditions.

10.3 Possibility of hazardous reactions.
Glycol Ethers can form peroxides on storage
Glycol ethers can react with light metals with the evolution of hydrogen.

10.4 Conditions to Avoid
Do not distil to dryness without testing for peroxide formation.

10.5 Incompatible Materials
Strong oxidising agents. For user safety, brake fluid should never be contaminated with any other substance .

10.6 Hazardous Decomposition Products
None known.

Section 11: Toxicological information (comments may be based on analogy with similar products).

11.1 Information on toxicological effects

11.1.1 Acute Toxicity
Ingestion -Product is of low acute oral toxicity – LD50 (oral) Rat = > 5000 mg/kg. (Sparse experience indicates lethal dose in man could be less). However, if any significant amount is ingested, there is a risk of renal damage which in extreme cases could lead to kidney failure, coma or death. Other symptoms of overexposure include Central Nervous System effects, abdominal discomfort, metabolic acidosis, headache and nausea.

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 above).
Aspiration –No aspiration hazard expected.
Dermal - Acute percutaneous toxicity is low LD50 (sk) Rabbit = > 3000 mg/kg. Massive contact with damaged skin could result in the absorption of harmful amounts.

11.1.2 Irritation
Eye Contact Not classified although may have a mildly irritating effect on the eye. (Test Method OECD 405).
Skin Contact - Based on available data the classification criteria are not met (Test Method OECD 404).
Repeated contact may de-fat the skin and cause dermatitis.

11.1.3 Corrosivity
Based on available data the classification criteria are not met.

11.1.4 Sensitisation
Based on available data the classification criteria are not met.

11.1.5 Repeated dose toxicity
There are no reports of long term adverse affects in man.

11.1.6 Carcinogenicity
Not known to be carcinogenic.

11.1.7 Mutagenicity
Not known to be mutagenic

11.1.8 Toxicity for reproduction
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 / H361d.

Section 12: Ecological information

12.1 Toxicity
Product is of low acute 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 toxic.

12.2 Persistence and Degradability
Product is inherently biodegradable and is expected to be readily biodegradable based on ingredients.
OECD 302B (Zahn Wellans/EMPA) = 100% elimination at 21 days.
If admitted into adapted biological water treatment plants, no adverse effects on the degrading action of the live sludge are expected.

12.3 Bioaccumulative Potential
Not expected to bio accumulate. Log POW for all main ingredients = < 2.0

12.4 Mobility in soil
Soluble in water and will partition to aqueous phase. Volatilisation from water to air not expected. Mobile in soil until degraded.

12.5 Results of PBT and vPvB assessment.
Product is considered to be neither “persistent, bio-accumulating and toxic” nor “very persistent and very bio-accumulating” according to Annex Xlll of Regulation EC 1907/2006.

12.6 Other adverse effects.
Not relevant.

Section 13: Disposal considerations

13.1 Waste treatment methods

Dispose of in accordance with local and national regulations. In the E.U. used brake fluids are classified as Hazardous Waste. EWC number: 16.01.13.
Controlled incineration or recycling is recommended. Do not dispose of to landfill or drains. It is recommended that contaminated packaging is either incinerated or cleaned and sent for recycling.

Section 14: Transport information

14.1 UN No. / Class	None
14.2 UN Proper shipping name	N/A
14.3 Transport hazard classes	
Land Transport	
ADR	Not classified
RID	Not classified
Sea Transport	
IMO/IMDG	Not classified
Marine Pollutant	No
Air Transport	
IATA/IACO	Not classified
Inland waterways	
ADN	Not classified
14.4 Packing Group	N/A
14.5 Environmental Hazards	Not environmentally hazardous
14.6 Special precautions for user	None relevant
14.7 Transport in bulk (annex ll of Marpol)	Not classified.

Section 15: Regulatory information

15.1 Safety, health and environmental regulations / legislation specific to the substance or mixture.

15.1.1 Chemical Inventories.
All ingredients are registered on the following inventories;

E.U. (EINECS / EILINCS)	USA (TSCA)	Canada (DSL/NDSL)	Australia (AICS)
Japan (ENCS)	China (IECSC)	Korea (ECL)	Philippine (PICCS)
New Zealand (NZLoC)	Taiwan		

15.1.2 WGK Hazard class
Assessed as WGK 1 (self assessment). Slight hazard to water.

15.1.3 Other
Usage should be in accord with all local and national regulations. In the U.K. this would include the Health and Safety at Work Act and the Control of Substances Hazardous to Health regulations (COSHH.)

15.2 Chemical safety assessment.

A chemical safety assessment has not been carried out for this product by the supplier.

Section 16: Other information

16.1 Abbreviations and acronyms used in this data sheet.

DPD –Dangerous Preparations Directive.
CLP –Classification, labelling and packaging of substances and mixtures regulation**,**

GHS –UN Globally Harmonised system of classification and labelling of chemicals
STOT –RE Specific Target Organ Toxicity –Repeated Exposure
R22 –Harmful if swallowed.
R36 –Irritating to eyes.
R41 –Risk of serious damage to eyes.
R63 –Possible risk of harm to the unborn child.
H302 –Harmful if swallowed
H318 – Causes serious eye damage
H319 – Causes serious eye irritation
H361d –Suspected of damaging fertility or the unborn child.
H373 –May cause damage to organs through prolonged or repeated exposure.

16.2 Classification according to regulation 1999/45/EC (DPD);
Not classified

16.3 Labelling according to 1999/45/EC (DPD):
Hazard symbol -None

Safety phrases recommended; S2 Keep out of the reach of children. S26 (modified) In case of contact with eyes, rinse immediately with plenty of water for 10 min. If irritation persists seek medical advice. S46 –If swallowed seek medical advice immediately and show this container or label.

16.4 Revisions
Changes to this issue of the MSDS are indicated by a bar in the left hand margin.

16.5 Legal Disclaimer
The information contained herein is based on the present knowledge and experience of Orthene Chemicals Ltd. It in no way constitutes the users own assessment of work place risk as required by other Health and Safety legislation.
Orthene Chemicals Ltd. does not, by supplying this information, guarantee or warrant any specific properties or qualities of goods supplied. It is the responsibility of the purchaser to determine whether the goods ordered are fit for any purpose for which they may be required.
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