

		Customer Documentation Request	
CUSTOMER:	EDP Renewables, North America	DATE : 09/16/2015	
PREPARED FOR:	TOM CAGUE	BY: COMMERCIAL	
COMPANY:	GAMESA WIND		
SUBJECT:	G114 2.0 / 2.1MW Wind Turbine Operating Oil, Greases & Lubricants		

Wind Turbine (WTG) Applicability

G114 STD 1 - 2.0 / 2.1 MW - 60Hz

G114 STD 2 - 2.0 / 2.1 MW - 60Hz

Oils / Lubricants

Application	Product Name	Qty (Per WTG)
Gearbox	FUCHS RENOLIN UNISYN 320 OIL (BTE 19)	512 liters
Hydraulic Unit	SHELL TELLUS OIL T32	290 liters
Gear Drives	SHELL OMALA S4 GX 320	60 liters

Grease

Application	Product Name	Qty (Per WTG)
Blade Bearings	SHELL RHODINA GREASE BBZ	10,500 grams
Main Bearings	KLUBERPLEX GREASE BEM 41-141	8,000 grams
Yaw Teeth	KLUBERPLEX GREASE AG 11-462	1000 grams
Yaw Sliding Plates	SHELL STAMINA HDS (GADUS S5 T460)	455 grams
Generator Bearings	KLUBERPLEX GREASE BEM 41-132	230 grams

Coolants

Application	Product Name	Qty (Per WTG)
Converter Cabinet	SHELL DEX-COOL® Extended Life Antifreeze	25 liters

Notes

Always refer to product name plate and manual for exact capacities for all lubrication / coolant types.

Always consult turbine specifications and manuals for latest revisions and quantities.

MATERIAL SAFETY DATA SHEET

Print date: 25-Apr-2011

Revision Number: 1

Revision date: 25-Apr-2011

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product Name: Klüberplex AG 11-462
Article Code: 039091
Synonyms: No information available
Chemical characterisation: Not applicable..

Supplier:
Klüber Lubrication North America L.P.
32 Industrial Drive
Londonderry, NH 03053
(603) 647-4104
Fax (603) 647-4106

Emergency telephone number CHEMTREC: 1-800-424-9300 International: (703) 527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No	ACGIH (TWA mg/m ³):	OSHA (TWA mg/m ³):
Mineral oil		None	None
Zinc sulfide		None	None
Ester oil		None	None
Aluminum complex soap		1	None

3. HAZARDS IDENTIFICATION

Properties affecting health: Harmful if swallowed

Principle routes of exposure: Skin.

Skin contact: Prolonged skin contact may cause skin irritation and/or dermatitis..

Eye contact: Contact with eyes may cause irritation.

Inhalation: Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract.

Ingestion: Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea

4. FIRST AID MEASURES

General advice: If symptoms persist, call a physician.

Skin contact: Rinse with plenty of water. If skin irritation persists, call a physician.

Inhalation:	Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. If symptoms persist, call a physician.
Eye contact:	Flush eye with water for 15 minutes. If symptoms persist, call a physician.
Ingestion:	Do not induce vomiting. Consult a physician.
Notes to physician:	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:

Carbon dioxide (CO₂), Dry chemical, Dry sand, Water spray mist or foam

Extinguishing media which must not be used for safety reasons:

Do not use a solid water stream as it may scatter and spread fire.

Special protective equipment for firefighters:

In the event of fire and/or explosion do not breathe fumes. In the event of fire, wear self-contained breathing apparatus. Standard procedure for chemical fires.

Specific hazards: Burning produces irritant fumes In the event of fire and/or explosion do not breathe fumes

Unusual hazards: No hazards resulting from the material as supplied

Specific methods: Water mist may be used to cool closed containers. Standard procedure for chemical fires.

Flash point: Not applicable.

Autoignition temperature: Not determined..

Flammability Limits in Air:

Lower	No information available
Upper	No information available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Contaminated surfaces will be extremely slippery. Avoid contact with skin, eyes and clothing. Wear personal protective equipment.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Prevent product from entering drains.

Methods for cleaning up: Scrape-up. Pick up and transfer to properly labelled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical measures/precautions:

Safe handling advice:

No special technical protective measures required. Spilling onto the container's outside will make container slippery. Avoid contact with skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical measures/storage conditions:

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep in properly labelled containers. Keep out of reach of children.

Incompatible products:

Oxidising and spontaneously flammable products.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:

Ensure adequate ventilation, especially in confined areas..

Personal Protective Equipment

Respiratory protection:	No personal respiratory protective equipment normally required.
Hand protection:	Preventive skin protection
Skin and body protection:	Usual safety precautions while handling the product will provide adequate protection against this potential effect..
Eye protection:	Avoid contact with eyes..
Hygiene measures:	Avoid contact with skin, eyes and clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Grease	Appearance:	Paste
Color:	White	Odor:	Not significant
Specific gravity:	~ 1.07	Boiling point/range	No information available
Evaporation rate:	Not determined	Vapor density:	Not determined
Vapor pressure:	Not determined	Solubility:	Insoluble.

10. STABILITY AND REACTIVITY

Stability:	No hazards to be especially mentioned
Polymerization:	Hazardous polymerisation does not occur.
Hazardous decomposition products:	None under normal use
Materials to avoid:	Strong oxidising agents.
Conditions to avoid:	Heat, flames and sparks..

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	No data available
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12. ECOLOGICAL INFORMATION

Mobility:	No information available.
Bioaccumulative potential:	No information available.
Ecotoxicity effects:	No data available.
Aquatic toxicity:	No information available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:	In accordance with local and national regulations.
Contaminated packaging:	Empty containers should be taken for local recycling, recovery or waste disposal

14. TRANSPORT INFORMATION

14. TRANSPORT INFORMATION

DOT

Proper shipping name: Not regulated by DOT

TDG (Canada)

IMO / IMDG

ICAO

IATA

15. REGULATORY INFORMATION

TSCA

TSCA: Listed in TSCA

U.S. Regulations:

Zinc sulfide

SARA 313 Threshold: Zinc compound (15 - 25%)

NJRTK: Substance no. 3012 Listed.

ILRTK: Listed.

CTRTK: Listed.

Sara (311, 312) hazard class:

Canada

WHMIS hazard class:

Non-controlled

16. OTHER INFORMATION

NFPA Health: 1 Flammability: 1 Instability: 0

HMIS Health: 1 Flammability: 1 Physical Hazard: 0

Reason for revision: Not applicable
Prepared by: Health & Safety

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MATERIAL SAFETY DATA SHEET

Print date: 13-Aug-2010

Revision Number: 1

Revision date: 13-Aug-2010

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product Name: Klüberplex BEM 41-132
Article Code: 020256
Synonyms: No information available
Chemical characterisation: Not applicable..

Supplier:

Klüber Lubrication North America L.P.
32 Industrial Drive
Londonderry, NH 03053
(603) 647-4104
Fax (603) 647-4106

Emergency telephone number CHEMTREC: 1-800-424-9300 International: (703) 527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No	ACGIH (TWA mg/m ³):	OSHA (TWA mg/m ³):
Mineral oil		None	None
Synthetic hydrocarbon oil		None	None
Special lithium soap		None	None

3. HAZARDS IDENTIFICATION

Properties affecting health: Harmful if swallowed

Principle routes of exposure: Skin.

Skin contact: Substance may cause slight skin irritation.

Eye contact: Contact with eyes may cause irritation.

Inhalation: Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract.

Ingestion: Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea

4. FIRST AID MEASURES

General advice: If symptoms persist, call a physician.

Skin contact: Rinse with plenty of water. If skin irritation persists, call a physician.

Inhalation: Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. If symptoms persist, call a physician.

Eye contact: Flush eye with water for 15 minutes. If symptoms persist, call a physician.
Ingestion: Do not induce vomiting. Consult a physician.
Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:
Carbon dioxide (CO₂), Dry chemical, Dry sand, Water spray mist or foam

Extinguishing media which must not be used for safety reasons:
Do not use a solid water stream as it may scatter and spread fire.

Special protective equipment for firefighters:
In the event of fire and/or explosion do not breathe fumes. In the event of fire, wear self-contained breathing apparatus. Standard procedure for chemical fires.

Specific hazards: Burning produces irritant fumes In the event of fire and/or explosion do not breathe fumes
Unusual hazards: No hazards resulting from the material as supplied
Specific methods: Water mist may be used to cool closed containers. Standard procedure for chemical fires.

Flash point: Not applicable.
Method: Cleveland Open Cup
Autoignition temperature: Not determined..

Flammability Limits in Air:

Lower	No information available
Upper	No information available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Contaminated surfaces will be extremely slippery. Avoid contact with skin, eyes and clothing. Wear personal protective equipment.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Prevent product from entering drains.

Methods for cleaning up: Scrape-up. Shovel into suitable container for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical measures/precautions:
Safe handling advice:

No special technical protective measures required. Spilling onto the container's outside will make container slippery. Avoid contact with skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical measures/storage conditions:

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep in properly labelled containers. Keep out of reach of children. Oxidising and spontaneously flammable products.

Incompatible products:

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:

Ensure adequate ventilation, especially in confined areas..

Personal Protective Equipment

Respiratory protection:	No personal respiratory protective equipment normally required.
Hand protection:	Preventive skin protection
Skin and body protection:	Usual safety precautions while handling the product will provide adequate protection against this potential effect..
Eye protection:	Avoid contact with eyes..
Hygiene measures:	Avoid contact with skin, eyes and clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Grease	Appearance:	Paste
Color:	Yellow	Odor:	Not significant
Specific gravity:	~ 0.9	Boiling point/range	No information available
Evaporation rate:	Not determined	Vapor density:	Not determined
Vapor pressure:	Not determined	Solubility:	Insoluble.

10. STABILITY AND REACTIVITY

Stability:	No hazards to be especially mentioned
Polymerization:	Hazardous polymerisation does not occur.
Hazardous decomposition products:	None under normal use
Materials to avoid:	Strong oxidising agents.
Conditions to avoid:	Heat, flames and sparks..

11. TOXICOLOGICAL INFORMATION

Acute toxicity	No data available
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12. ECOLOGICAL INFORMATION

Mobility:	No information available.
Bioaccumulative potential:	No information available.
Ecotoxicity effects:	No data available.
Aquatic toxicity:	No information available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:	In accordance with local and national regulations.
Contaminated packaging:	Empty containers should be taken for local recycling, recovery or waste disposal

14. TRANSPORT INFORMATION

DOT	
Proper shipping name:	Not regulated by DOT

TDG (Canada)

14. TRANSPORT INFORMATION

IMO / IMDG

ICAO

IATA

15. REGULATORY INFORMATION

TSCA

TSCA: Listed in TSCA

U.S. Regulations:

Sara (311, 312) hazard class:

Canada

WHMIS hazard class:
Non-controlled

16. OTHER INFORMATION

<u>NFPA</u>	Health:	1	Flammability:	1	Instability:	0
<u>HMIS</u>	Health:	1	Flammability:	1	Physical Hazard:	0

Reason for revision: Not applicable
Prepared by: Health & Safety

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MATERIAL SAFETY DATA SHEET

Print date: 27-Aug-2013

Revision Number: 3

Revision date: 27-Aug-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product Name: Klüberplex BEM 41-141
Article Code: 020320
Synonyms: No information available
Chemical characterisation: Not applicable..

Supplier:
Klüber Lubrication North America L.P.
32 Industrial Drive
Londonderry, NH 03053
(603) 647-4104
Fax (603) 647-4106

Emergency telephone number CHEMTREC: 1-800-424-9300 International: (703) 527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No	ACGIH (TWA mg/m ³):	OSHA (TWA mg/m ³):
Synthetic hydrocarbon oil		None	None
Residual oils (petroleum), solvent-refined		None	None
Special lithium soap		None	None

3. HAZARDS IDENTIFICATION

Properties affecting health: Harmful if swallowed

Principle routes of exposure: Skin.

Skin contact: Prolonged skin contact may cause skin irritation and/or dermatitis.

Eye contact: Contact with eyes may cause irritation.

Inhalation: Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract.

Ingestion: Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea

4. FIRST AID MEASURES

General advice: If symptoms persist, call a physician.

Skin contact: Rinse with plenty of water. If skin irritation persists, call a physician.

Eye contact: Flush eye with water for 15 minutes. If symptoms persist, call a physician.

Inhalation: Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. If symptoms persist, call a physician.

Ingestion: Do not induce vomiting. Consult a physician.

Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:

Carbon dioxide (CO₂), Dry chemical, Dry sand, Water spray mist or foam

Extinguishing media which must not be used for safety reasons:

Do not use a solid water stream as it may scatter and spread fire.

Special protective equipment for firefighters:

In the event of fire and/or explosion do not breathe fumes. In the event of fire, wear self-contained breathing apparatus. Standard procedure for chemical fires.

Specific hazards: Burning produces irritant fumes. In the event of fire and/or explosion do not breathe fumes.

Unusual hazards: No hazards resulting from the material as supplied.

Specific methods: Water mist may be used to cool closed containers. Standard procedure for chemical fires.

Flash point: Not applicable.

Autoignition temperature: Not determined.

Flammability Limits in Air:

Lower	No information available
Upper	No information available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Contaminated surfaces will be extremely slippery. Avoid contact with skin, eyes and clothing. Wear personal protective equipment.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Prevent product from entering drains.

Methods for cleaning up: Scrape-up. Pick up and transfer to properly labelled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical measures/precautions:

Safe handling advice:

No special technical protective measures required. Spilling onto the container's outside will make container slippery. Avoid contact with skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical measures/storage conditions:

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep in properly labelled containers. Keep out of reach of children.

Incompatible products:

No materials to be specially mentioned.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:

Ensure adequate ventilation, especially in confined areas..

Personal Protective Equipment

Respiratory protection:	No personal respiratory protective equipment normally required.
Hand protection:	Impervious gloves.
Skin and body protection:	Usual safety precautions while handling the product will provide adequate protection against this potential effect.
Eye protection:	Safety glasses with side-shields.
Hygiene measures:	Avoid contact with skin, eyes and clothing

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Grease	Appearance:	Paste
Color:	Yellow	Odor:	Not significant
Specific gravity:	~ 0.88	Boiling point/range	No information available
Evaporation rate:	Not determined	Vapor density:	Not determined
Vapor pressure:	Not determined	Solubility:	Insoluble.

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions
Polymerization:	Hazardous polymerisation does not occur.
Hazardous decomposition products:	None under normal use
Materials to avoid:	Strong oxidising agents.
Conditions to avoid:	Heat, flames and sparks..

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	No data available
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12. ECOLOGICAL INFORMATION

Mobility:	No information available.
Bioaccumulative potential:	No information available.
Ecotoxicity effects:	No data available.
Aquatic toxicity:	No information available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:	In accordance with local and national regulations.
Contaminated packaging:	Empty containers should be taken for local recycling, recovery or waste disposal

14. TRANSPORT INFORMATION

DOT

14. TRANSPORT INFORMATION

Proper shipping name: Not regulated

TDG (Canada)

IMO / IMDG

Proper shipping name: Not regulated

ICAO

IATA

Proper shipping name: Not regulated

15. REGULATORY INFORMATION

TSCA

TSCA: Listed in TSCA

U.S. Regulations:

Sara (311, 312) hazard class:

Canada

WHMIS hazard class:
Not determined

16. OTHER INFORMATION

NFPA Health: 1 Flammability: 1 Instability: 0

HMIG Health: 1 Flammability: 1 Reactivity: 0

Reason for revision: Not applicable
Prepared by: Health & Safety

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Material Safety Data Sheet

According to 2001/58/ EC

Printing date 18.09.2006

Reviewed on 18.09.2006

1 Identification of substance:

· **Product details:**

- **Trade name:** RENOLIN UNISYN CLP 320
- **Application of the substance / the preparation** Lubricant

· **Manufacturer/Supplier:**

Fuchs Lubricantes S.A.
Polígono Industrial San Vicente
08755 CASTELLBISBAL. ESPAÑA

Tel: 93-7730267

- **Further information obtainable from:** Laboratory

2 Composition/Data on components:

- **Chemical characterization:** Mixture of synthetic base oils with additives.

· **Chemical characterization**

· **Dangerous components:**

Olefinic sulfide	R 53	< 2.5%
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- **Additional information** For the wording of the listed risk phrases refer to section 16.

3 Hazard identification

- **Hazard description:** not applicable
- **Information concerning to particular hazards to man and environment**
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- **Classification system**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

4 First aid measures

- **General information** Immediately remove any clothing soiled by the product.
- **After inhalation** Supply fresh air; consult doctor in case of complaints.
- **After skin contact** Generally the product does not irritate the skin.
- **After eye contact** Rinse opened eye for several minutes under running water.
- **After swallowing** If symptoms persist consult doctor.

5 Fire fighting measures

- **Suitable extinguishing agents**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Use fire extinguishing methods suitable to surrounding conditions.
- **For safety reasons unsuitable extinguishing agents** Water with full jet.

(Contd. on page 2)

Material Safety Data Sheet

According to 2001/58/ EC

Printing date 18.09.2006

Reviewed on 18.09.2006

Trade name: RENOLIN UNISYN CLP 320

(Contd. of page 1)

- **Protective equipment:** Do not inhale explosion gases or combustion gases.

6 Accidental release measures

- **Person-related safety precautions:**
Particular danger of slipping on leaked/spilled product.
- **Measures for environmental protection:**
Do not allow to penetrate the ground/soil.
Do not allow to enter sewers/ surface or ground water.
- **Measures for cleaning/collecting:** Pick up mechanically.
- **Additional information:** No dangerous substances are released.

7 Handling and storage

- **Handling**
- **Information for safe handling:** No special measures required.
- **Information about fire - and explosion protection:**
Do not heat up flash point temperature.
- **Storage**
- **Requirements to be met by storerooms and receptacles:** Consult local legislation
- **Information about storage in one common storage facility:**
Store away from foodstuffs.
- **Further information about storage conditions:** None.

8 Exposure controls and personal protection gear

- **Additional information about design of technical facilities:**
No further data; see item 7.
- **Ingredients with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists valid during the making were used as basis.
- **Personal protective equipment**
- **General protective and hygienic measures**
Do not carry product impregnated cleaning cloths in trouser pockets.
Avoid close or long term contact with the skin.
Wash hands before breaks and at the end of work.
- **Respiratory protection:** Not required.
- **Protection of hands:**



Protective gloves.

(Contd. on page 3)

GB

Material Safety Data Sheet

According to 2001/58/ EC

Printing date 18.09.2006

Reviewed on 18.09.2006

Trade name: RENOLIN UNISYN CLP 320

(Contd. of page 2)

· **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product 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.

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:** Safety glasses

· **Body protection:** Protective work clothing.

9 Physical and chemical properties:

· **General Information**

Form:	Fluid
Colour:	Light yellow
Odour:	Characteristic

· **Change in condition**

Melting point/Melting range: undetermined
Boiling point/Boiling range: undetermined

· **Flash point:** >260°C

· **Self-igniting:** Product is not selfigniting.

· **Danger of explosion:** Product does not present an explosion hazard.

· **Density at 15°C:** 0.86 g/cm³

· **Solubility in / Miscibility with**

Water: Insoluble

· **Viscosity:**

kinematic at 20°C: 320 mm²/s (DIN 51562)

10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:**

No decomposition if used according to specifications.

· **Dangerous reactions** No dangerous reactions known

· **Dangerous decomposition products:** No dangerous decomposition products known

GB

(Contd. on page 4)

Material Safety Data Sheet

According to 2001/58/ EC

Printing date 18.09.2006

Reviewed on 18.09.2006

Trade name: RENOLIN UNISYN CLP 320

(Contd. of page 3)

11 Toxicological information

- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** No irritant effect.
- **on the eye:** No irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**

The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version. When used and handled according to specifications, the product does not have any harmful effects to our experience and the information provided to us.

12 Ecological information:

- **General notes:**
- Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water.
- Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

13 Disposal considerations

- **Product:**
- **Recommendation**
- Must be specially treated adhering to official regulations.
- Delivery of waste oil to officially authorized collectors only.
- Smaller quantities can be disposed of with household waste.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- **Land transport ADR/RID (cross-border)**
- **ADR/RID class:** -
- **Maritime transport IMDG:**
- **IMDG Class:** -
- **Marine pollutant:** No
- **Air transport ICAO-TI and IATA-DGR:**
- **ICAO/IATA Class:** -

GB

(Contd. on page 5)

Material Safety Data Sheet

According to 2001/58/ EC

Printing date 18.09.2006

Reviewed on 18.09.2006

Trade name: RENOLIN UNISYN CLP 320

(Contd. of page 4)

15 Regulations

· **Labelling according to EU guidelines:**

Observe the general safety regulations when handling chemicals

The product is not subject to identification regulations under EU Directives and the Ordinance on Hazardous Materials (German GefStoffV).

· **Special labelling of certain preparations:**

Safety data sheet available for professional user on request.

· **National regulations**

· **Waterhazard class:**

Water hazard class 1 (Self-assessment): slightly hazardous for water.

16 Other information:

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant R-phrases**

53 May cause long-term adverse effects in the aquatic environment.

· **Department issuing MSDS:** Environment protection department.

· **Contact:** Químico I+D



SHELL DEX-COOL®

ANTIFREEZE/COOLANT

Extended Life Antifreeze

Product Description

Shell DEX-COOL® Extended Life Antifreeze/Coolant is a single-phase, ethylene glycol based, extended life, universal automotive engine coolant based on a unique extended life carboxylate inhibitor system. Shell DEX-COOL® is suitable for a five year or 150,000 mile service life in automotive applications. In heavy-duty applications not requiring nitrite Shell DEX-COOL® is suitable for a service life of 400,000 miles or 8,000 hours. Shell DEX-COOL® Prediluted 50/50 is a 50/50 volume mixture of Shell DEX-COOL® with deionized water.

Applications

- extended life universal automotive gasoline or diesel engine antifreeze/coolant
- extended life universal heavy-duty diesel antifreeze/coolant for systems not requiring nitrite
- extended life antifreeze/coolant meeting Japanese silicate free requirements
- extended life antifreeze/coolant meeting European phosphate free requirements

Features and Benefits

- meets GM6277M--General Motor's new Extended Life Coolant specification (DEX-COOL®)
- 5 year or 150,000 miles service interval
- provides effective, long term corrosion protection for aluminum, brass, cast iron, steel, solder and copper
- superior high temperature aluminum protection
- improved water pump life
- maintains good as new heat transfer due to no silicate containing formula
- reduces silicate gel formation in use or in storage
- storage stable for at least eight years
- 100% biodegradable in its pure unused form
- compatible with conventional antifreeze. Further dilution of a 50/50 mixture with more than 10% conventional coolant or water will reduce cooling system protection.
- all product bittered to help render product unpalatable

Approvals

- GM DEX-COOL® approval
- General Motors GM6277M
- General Motors GM1825M
- Concentrate meets ASTM D 3306 incl. D 4340 and ASTM D 4985
- Pre-dilute meets ASTM 4656
- Federal Specification A-A-870
- General Motors GM1899M (Performance corresponding to GM6038M)
- Chrysler MS-9769 (meets performance requirements)
- Ford ESE-M97B44-D1
- Volkswagen/Audi G-12

Typical Characteristics

Shell DEX-COOL® Extended Life Antifreeze/ Coolant	Typical Concentrate	Typical Pre-diluted 50/50
Code No.	94040	94070
Appearance	Orange	Orange
Specific gravity 60/60 °F	1.130	1.06
Freezing point, °F (ASTM D 1177) 50 vol. % q.s. aqueous solution	-34	
Freeze point, °F, as purchased		-34
pH (ASTM D 1287), 1:2 dilution with water	8.3	8.3
Reserve Alkalinity (ASTM D 1121), as received	6.0	3.0
Silicate, % (as Anhydrous Alkali Metasilicate)	None	None

Recommended dilution for Shell DEX-COOL® Extended Life Antifreeze/Coolant concentrate

Boiling Protection, °F (C) (15 lb. pressure cap) 50% (1 part AF/1 part water)	265 (129.4)
Freezing Protection, °F (C) 40% (2 parts AF/3 parts water)	-12 (-24.4)
50% (1 part AF/1 part water)	-34 (-37.2)
60% (3 parts AF/2 parts water)	-61 (-51.7)

Note:

For optimum year round protection against freezing, boiling and corrosion, a 50 percent Shell DEX-COOL® Extended Life Antifreeze/Coolant concentrate solution (1 part AF/1 part water) is recommended. For maximum protection against freezing in extremely cold areas, a 60 percent solution (3 parts AF/2 parts water) can be used. Concentrations greater than 67 percent or less than 40 percent are not recommended. Shell DEX-COOL® Extended Life Antifreeze/Coolant Pre-diluted 50/50 should be used as purchased. No further dilution is recommended. Dilution of a 50/50 mixture by more than 10% with conventional coolants or water will reduce corrosion and freeze point protection.

Handling and Safety Information

Shell DEX-COOL® Extended Life Coolant has a shelf life of at least 8 years. Concentrate product should be mixed before use. Always dispose of used coolant in accordance with local, state and federal guidelines. These products are not to be used to protect the inside of potable water systems against freezing. For information on the safe handling and use of this product, refer to its Material Safety Data Sheet at <http://www.shell-lubricants.com/msds/>. For more information and availability, call 1+800-782-7852 or World Wide Web: <http://www.shell-lubricants.com/>.

Material Safety Data Sheet

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : Shell Omala S4 GX 320
Uses : Gear lubricant.

Manufacturer/Supplier : SOPUS Products
 PO BOX 4427
 Houston, TX 77210-4427
 USA

MSDS Request : 877-276-7285

Emergency Telephone Number
Spill Information : 877-242-7400
Health Information : 877-504-9351

2. COMPOSITION/INFORMATION ON INGREDIENTS

Blend of polyolefins and additives.

The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

The highly refined mineral oil is only present as additive diluent.

Sensitiser not sufficient to classify : May produce an allergic reaction.

3. HAZARDS IDENTIFICATION

Emergency Overview	
Appearance and Odour	: Amber. Liquid at room temperature. Slight hydrocarbon.
Health Hazards	: Not classified as dangerous for supply or conveyance.
Safety Hazards	: Not classified as flammable but will burn.
Environmental Hazards	: Not classified as dangerous for the environment.

Health Hazards : Not expected to be a health hazard when used under normal conditions.

Health Hazards Inhalation : Under normal conditions of use, this is not expected to be a primary route of exposure.

Skin Contact : Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.

Eye Contact : May cause slight irritation to eyes.

Ingestion : Low toxicity if swallowed.

Other Information : Used oil may contain harmful impurities.

Signs and Symptoms : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.

Aggravated Medical Conditions : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this

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Environmental Hazards : material: Skin.
Additional Information : Not classified as dangerous for the environment.
 : Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

4. FIRST AID MEASURES

General Information : Not expected to be a health hazard when used under normal conditions.
Inhalation : No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
Skin Contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.
Eye Contact : Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
Ingestion : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
Advice to Physician : Treat symptomatically.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point : Typical 252 °C / 486 °F (COC)
Upper / lower Flammability or Explosion limits : Typical 1 - 10 %(V)
Auto ignition temperature : > 320 °C / 608 °F
Specific Hazards : Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds.
Suitable Extinguishing Media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable Extinguishing Media : Do not use water in a jet.
Protective Equipment for Firefighters : Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe the relevant local and international regulations.

Protective measures : Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.

Material Safety Data Sheet

- Clean Up Methods** : Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.
- Additional Advice** : Local authorities should be advised if significant spillages cannot be contained.

7. HANDLING AND STORAGE

- General Precautions** : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
- Handling** : Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
- Storage** : Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Storage Temperature: 0 - 50 °C / 32 - 122 °F
- Recommended Materials** : For containers or container linings, use mild steel or high density polyethylene.
- Unsuitable Materials** : PVC.
- Additional Information** : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

None established.

Material	Source	Type	ppm	mg/m3	Notation
Oil mist, mineral	ACGIH	TWA(Inhalable fraction.)		5 mg/m3	
Oil mist, mineral	OSHA Z1	PEL(Mist.)		5 mg/m3	
Oil mist, mineral	OSHA Z1A	TWA(Mist.)		5 mg/m3	

- Additional Information** : Shell has adopted as Interim Standards the OSHA Z1A values that were established in 1989 and later rescinded.

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- Exposure Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.
- Personal Protective Equipment** : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Respiratory Protection** : No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65°C(149 °F)].
- Hand Protection** : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
- Eye Protection** : Wear safety glasses or full face shield if splashes are likely to occur.
- Protective Clothing** : Skin protection not ordinarily required beyond standard issue work clothes.
- Monitoring Methods** : Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
- Environmental Exposure Controls** : Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Amber. Liquid at room temperature.
Odour : Slight hydrocarbon.

Material Safety Data Sheet

pH	: Not applicable.
Initial Boiling Point and Boiling Range	: > 280 °C / 536 °F estimated value(s)
Pour point	: Typical -42 °C / -44 °F
Flash point	: Typical 252 °C / 486 °F (COC)
Upper / lower Flammability or Explosion limits	: Typical 1 - 10 %(V)
Auto-ignition temperature	: > 320 °C / 608 °F
Vapour pressure	: < 0.5 Pa at 20 °C / 68 °F (estimated value(s))
Specific gravity	: Typical 0.883 at 15 °C / 59 °F
Density	: Typical 883 kg/m ³ at 15 °C / 59 °F
Water solubility	: Negligible.
n-octanol/water partition coefficient (log Pow)	: > 6 (based on information on similar products)
Kinematic viscosity	: Typical 312.7 mm ² /s at 40 °C / 104 °F
Vapour density (air=1)	: > 1 (estimated value(s))
Evaporation rate (nBuAc=1)	: Data not available

10. STABILITY AND REACTIVITY

Stability	: Stable.
Conditions to Avoid	: Extremes of temperature and direct sunlight.
Materials to Avoid	: Strong oxidising agents.
Hazardous Decomposition Products	: Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on data on the components and the toxicology of similar products.
Acute Oral Toxicity	: Expected to be of low toxicity: LD50 > 5000 mg/kg , Rat
Acute Dermal Toxicity	: Expected to be of low toxicity: LD50 > 5000 mg/kg , Rabbit
Acute Inhalation Toxicity	: Not considered to be an inhalation hazard under normal conditions of use.
Skin Irritation	: Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Irritation	: Expected to be slightly irritating.
Respiratory Irritation	: Inhalation of vapours or mists may cause irritation.
Sensitisation	: Not expected to be a skin sensitiser.
Repeated Dose Toxicity	: Not expected to be a hazard.
Mutagenicity	: Not considered a mutagenic hazard.
Carcinogenicity	: Components are not known to be associated with carcinogenic effects.
Reproductive and Developmental Toxicity	: Not expected to be a hazard.
Additional Information	: Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled

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with caution and skin contact avoided as far as possible.

12. UMWELTBEZOGENE ANGABEN

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

- Acute Toxicity** : Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract).
- Mobility** : Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.
- Persistence/degradability** : Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.
- Bioaccumulation** : Contains components with the potential to bioaccumulate.
- Other Adverse Effects** : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

13. DISPOSAL CONSIDERATIONS

- Material Disposal** : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.
- Container Disposal** : Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
- Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. TRANSPORT INFORMATION**US Department of Transportation Classification (49CFR)**

This material is not subject to DOT regulations under 49 CFR Parts 171-180.

IMDG

This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)

Material Safety Data Sheet

This material is not classified as dangerous under IATA regulations.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Federal Regulatory Status

Notification Status

EINECS	All components listed or polymer exempt.
TSCA	All components listed.
DSL	All components listed.

Shell classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA.

SARA Hazard Categories (311/312)

No SARA 311/312 Hazards.

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This material does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

NFPA Rating (Health, Fire, Reactivity)	:	0, 1, 0
MSDS Version Number	:	1.0
MSDS Effective Date	:	03/02/2011
MSDS Revisions	:	A vertical bar () in the left margin indicates an amendment from the previous version.
MSDS Regulation	:	The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
MSDS Distribution	:	The information in this document should be made available to all who may handle the product.

Shell Omala S4 GX 320

MSDS# DEU003484

Version 1.0

Effective Date 03/02/2011

According to OSHA Hazard Communication Standard, 29 CFR
1910.1200

Material Safety Data Sheet

Disclaimer

: The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

Material Safety Data Sheet

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : Shell Rhodina Grease BBZ
Uses : Automotive and industrial grease.

Manufacturer/Supplier : SOPUS Products
 PO BOX 4427
 Houston, TX 77210-4427
 USA

MSDS Request : 877-276-7285

Emergency Telephone Number
Spill Information : 877-242-7400
Health Information : 877-504-9351

2. COMPOSITION/INFORMATION ON INGREDIENTS

Highly refined mineral oils, polyalphaolefins and additives.
 The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

3. HAZARDS IDENTIFICATION

Emergency Overview	
Appearance and Odour	: Brown. Semi-solid at ambient temperature. Slight hydrocarbon.
Health Hazards	: High-pressure injection under the skin may cause serious damage including local necrosis.
Safety Hazards	: Not classified as flammable but will burn.
Environmental Hazards	: Not classified as dangerous for the environment.

Health Hazards : Not expected to be a health hazard when used under normal conditions.

Health Hazards Inhalation : Under normal conditions of use, this is not expected to be a primary route of exposure.

Skin Contact : Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.

Eye Contact : May cause slight irritation to eyes.

Ingestion : Low toxicity if swallowed.

Other Information : High-pressure injection under the skin may cause serious damage including local necrosis. Used grease may contain harmful impurities.

Signs and Symptoms : Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection. Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.

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- Aggravated Medical Condition** : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Skin.
- Environmental Hazards** : Not classified as dangerous for the environment.
- Additional Information** : Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

4. FIRST AID MEASURES

- General Information** : Not expected to be a health hazard when used under normal conditions.
- Inhalation** : No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
- Skin Contact** : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop. Obtain medical attention even in the absence of apparent wounds.
- Eye Contact** : Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
- Ingestion** : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
- Advice to Physician** : Treat symptomatically. High pressure injection injuries require prompt surgical intervention and possibly steroid therapy, to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

- Flash point** : > 200 °C / 392 °F (COC)
- Upper / lower Flammability or Explosion limits** : Typical 1 - 10 %(V)(based on mineral oil)
- Auto ignition temperature** : > 320 °C / 608 °F
- Specific Hazards** : Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds.

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- Suitable Extinguishing Media** : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
- Unsuitable Extinguishing Media** : Do not use water in a jet.
- Protective Equipment for Firefighters** : Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe all relevant local and international regulations.

- Protective measures** : Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
- Clean Up Methods** : Shovel into a suitable clearly marked container for disposal or reclamation in accordance with local regulations.

7. HANDLING AND STORAGE

- General Precautions** : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
- Handling** : Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
- Storage** : Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Storage Temperature: 0 - 50 °C / 32 - 122 °F
- Recommended Materials** : For containers or container linings, use mild steel or high density polyethylene.
- Unsuitable Materials** : PVC.
- Additional Information** : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Oil mist, mineral	ACGIH	TWA(Mist.)		5 mg/m3	
Oil mist, mineral	ACGIH	STEL(Mist.)		10 mg/m3	

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- Additional Information** : Due to the product's semi-solid consistency, generation of mists and dusts is unlikely to occur.
- Exposure Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.
- Personal Protective Equipment** : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Respiratory Protection** : No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65 °C (149 °F)].
- Hand Protection** : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
- Eye Protection** : Wear safety glasses or full face shield if splashes are likely to occur.
- Protective Clothing** : Skin protection not ordinarily required beyond standard issue work clothes.
- Monitoring Methods** : Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
- Environmental Exposure Controls** : Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Material Safety Data Sheet

Appearance	: Brown. Semi-solid at ambient temperature.
Odour	: Slight hydrocarbon.
pH	: Not applicable.
Initial Boiling Point and Boiling Range	: Data not available
Dropping point	: Typical 140 °C / 284 °F
Flash point	: > 200 °C / 392 °F (COC)
Upper / lower Flammability or Explosion limits	: Typical 1 - 10 %(V) (based on mineral oil)
Auto-ignition temperature	: > 320 °C / 608 °F
Vapour pressure	: < 0.5 Pa at 20 °C / 68 °F (estimated value(s))
Density	: Typical 900 kg/m ³ at 15 °C / 59 °F
Water solubility	: Negligible.
n-octanol/water partition coefficient (log Pow)	: > 6 (based on information on similar products)
Kinematic viscosity	: Not applicable.
Vapour density (air=1)	: > 1 (estimated value(s))
Evaporation rate (nBuAc=1)	: Data not available

10. STABILITY AND REACTIVITY

Stability	: Stable.
Conditions to Avoid	: Extremes of temperature and direct sunlight.
Materials to Avoid	: Strong oxidising agents.
Hazardous Decomposition Products	: Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on data on the components and the toxicology of similar products.
Acute Oral Toxicity	: Expected to be of low toxicity: LD50 > 5000 mg/kg , Rat
Acute Dermal Toxicity	: Expected to be of low toxicity: LD50 > 5000 mg/kg , Rabbit
Acute Inhalation Toxicity	: Not considered to be an inhalation hazard under normal conditions of use.
Skin Irritation	: Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Irritation	: Expected to be slightly irritating.
Respiratory Irritation	: Inhalation of vapours or mists may cause irritation.
Sensitisation	: Not expected to be a skin sensitiser.
Repeated Dose Toxicity	: Not expected to be a hazard.
Mutagenicity	: Not considered a mutagenic hazard.
Carcinogenicity	: Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC). Other components are not known to be associated with carcinogenic effects.
Reproductive and Developmental Toxicity	: Not expected to be a hazard.

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Additional Information : Used grease may contain harmful impurities that have accumulated during use. The concentration of such harmful impurities will depend on use and they may present risks to health and the environment on disposal. ALL used grease should be handled with caution and skin contact avoided as far as possible. High pressure injection of product into the skin may lead to local necrosis if the product is not surgically removed.

12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Acute Toxicity : Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

Mobility : Semi-solid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

Persistence/degradability : Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

Bioaccumulation : Contains components with the potential to bioaccumulate.

Other Adverse Effects : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

13. DISPOSAL CONSIDERATIONS

Material Disposal : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.

Container Disposal : Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.

Local Legislation : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. TRANSPORT INFORMATION

US Department of Transportation Classification (49CFR)

Material Safety Data Sheet

This material is not subject to DOT regulations under 49 CFR Parts 171-180.

IMDG

This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)

This material is not classified as dangerous under IATA regulations.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Federal Regulatory Status

Notification Status

EINECS	All components listed or polymer exempt.
TSCA	All components listed.
DSL	All components listed.

SARA Hazard Categories (311/312)

No SARA 311/312 Hazards.

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This material does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

NFPA Rating (Health, Fire, Reactivity)	:	0, 1, 0
MSDS Version Number	:	1.0
MSDS Effective Date	:	10/03/2008
MSDS Revisions	:	A vertical bar () in the left margin indicates an amendment from the previous version.
MSDS Regulation	:	The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Material Safety Data Sheet

MSDS Distribution : The information in this document should be made available to all who may handle the product.

Disclaimer : The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

Material Safety Data Sheet**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING**

Material Name : Shell Stamina Grease HDS
Uses : Automotive and industrial grease.
Product Code : 001A0875

Manufacturer/Supplier : **Société des Pétroles Shell**
 Immeuble les Portes de la Défense
 307 Rue D'Estienne D'Orves
 F-92708 Colombes Cedex

Telephone : (+33) 0969366018
Fax : (+33) 0969366030
Email Contact for MSDS : If you have any enquiries about the content of this MSDS please email lubricantSDS@shell.com

Emergency Telephone Number : Shell (en France 24/24h): 0800 33 86 86 (+33 4 27 46 37 02)
 ORFILA: 01 45 42 59 59

2. HAZARDS IDENTIFICATION

EC Classification : Not classified as dangerous under EC criteria.

Health Hazards : Not expected to be a health hazard when used under normal conditions. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis. High-pressure injection under the skin may cause serious damage including local necrosis. Used grease may contain harmful impurities.

Signs and Symptoms : Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection. Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.

Safety Hazards : Not classified as flammable but will burn.
Environmental Hazards : Not classified as dangerous for the environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation description : A lubricating grease containing polyolefins and additives.

Hazardous Components

Chemical Identity	CAS	EINECS	Symbol(s)	R-phrases(s)	Conc.
Calcium long chain alkyl salicylate				R52/53	1,00 - 3,00 %

Additional Information : Refer to chapter 16 for full text of EC R-phrases.

Material Safety Data Sheet**4. FIRST AID MEASURES**

- General Information** : Not expected to be a health hazard when used under normal conditions.
- Inhalation** : No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
- Skin Contact** : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop. If persistent irritation occurs, obtain medical attention. Obtain medical attention even in the absence of apparent wounds.
- Eye Contact** : Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
- Ingestion** : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
- Advice to Physician** : Treat symptomatically. High pressure injection injuries require prompt surgical intervention and possibly steroid therapy, to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

- Specific Hazards** : Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds.
- Suitable Extinguishing Media** : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
- Unsuitable Extinguishing Media** : Do not use water in a jet.
- Protective Equipment for Firefighters** : Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal.

- Protective measures** : Avoid contact with skin and eyes. Use appropriate containment

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- to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
- Clean Up Methods** : Shovel into a suitable clearly marked container for disposal or reclamation in accordance with local regulations.

7. HANDLING AND STORAGE

- General Precautions** : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
- Handling** : Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
- Storage** : Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Storage Temperature: 0 - 50°C / 32 - 122°F
- Recommended Materials** : For containers or container linings, use mild steel or high density polyethylene.
- Unsuitable Materials** : PVC.
- Additional Information** : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

Occupational Exposure Limits

- Additional Information** : Due to the product's semi-solid consistency, generation of mists and dusts is unlikely to occur.
- Exposure Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.
- Personal Protective Equipment** : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Respiratory Protection** : No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne

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concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65 °C (149 °F)] meeting EN141.

Hand Protection	:	Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
Eye Protection	:	Wear safety glasses or full face shield if splashes are likely to occur. Approved to EU Standard EN166.
Protective Clothing	:	Skin protection not ordinarily required beyond standard issue work clothes.
Monitoring Methods	:	Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Environmental Exposure Controls	:	Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Light brown. Semi-solid at room temperature.
Odour	:	Slight hydrocarbon.
pH	:	Not applicable.
Initial Boiling Point and Boiling Range	:	Data not available
Dropping point	:	Typical 250 °C / 482 °F
Flash point	:	> 200 °C / 392 °F (COC)
Upper / lower Flammability or Explosion limits	:	Typical 1 - 10 %(V)
Auto-ignition temperature	:	> 320 °C / 608 °F
Vapour pressure	:	< 0,5 Pa at 20 °C / 68 °F (estimated value(s))
Density	:	Typical 900 kg/m ³ at 15 °C / 59 °F
Water solubility	:	Negligible.
n-octanol/water partition coefficient (log Pow)	:	> 6 (based on information on similar products)
Kinematic viscosity	:	Not applicable.
Vapour density (air=1)	:	> 1 (estimated value(s))
Evaporation rate (nBuAc=1)	:	Data not available

Material Safety Data Sheet**10. STABILITY AND REACTIVITY**

Stability	: Stable.
Conditions to Avoid	: Extremes of temperature and direct sunlight.
Materials to Avoid	: Strong oxidising agents.
Hazardous Decomposition Products	: Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on data on the components and the toxicology of similar products.
Acute Oral Toxicity	: Expected to be of low toxicity: LD50 > 5000 mg/kg , Rat
Acute Dermal Toxicity	: Expected to be of low toxicity: LD50 > 5000 mg/kg , Rabbit
Acute Inhalation Toxicity	: Not considered to be an inhalation hazard under normal conditions of use.
Skin Irritation	: Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Irritation	: Expected to be slightly irritating.
Respiratory Irritation	: Inhalation of vapours or mists may cause irritation.
Sensitisation	: Not expected to be a skin sensitiser.
Repeated Dose Toxicity	: Not expected to be a hazard.
Mutagenicity	: Not considered a mutagenic hazard.
Carcinogenicity	: Components are not known to be associated with carcinogenic effects.
Reproductive and Developmental Toxicity	: Not expected to be a hazard.
Additional Information	: Used grease may contain harmful impurities that have accumulated during use. The concentration of such harmful impurities will depend on use and they may present risks to health and the environment on disposal. ALL used grease should be handled with caution and skin contact avoided as far as possible. High pressure injection of product into the skin may lead to local necrosis if the product is not surgically removed.

12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Acute Toxicity	: Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract).
Mobility	: Semi-solid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.
Persistence/degradability	: Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product

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- Bioaccumulation** : contains components that may persist in the environment.
: Contains components with the potential to bioaccumulate.
- Other Adverse Effects** : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

13. DISPOSAL CONSIDERATIONS

- Material Disposal** : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.
- Container Disposal** : Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
- Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations.
EU Waste Disposal Code (EWC): 12 01 12 spent waxes and fats. Classification of waste is always the responsibility of the end user.

14. TRANSPORT INFORMATION**ADR**

This material is not classified as dangerous under ADR regulations.

RID

This material is not classified as dangerous under RID regulations.

ADNR

This material is not classified as dangerous under ADNR regulations.

IMDG

This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)

This material is not classified as dangerous under IATA regulations.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

- EC Classification : Not classified as dangerous under EC criteria.
EC Symbols : No Hazard Symbol required
EC Risk Phrases : Not classified.

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EC Safety Phrases	:	Not classified.
Local Inventories		
EINECS	:	All components listed or polymer exempt.
TSCA	:	All components listed.
Other Information	:	Social security code - Article L.461-6, Appendix A, no. 601-15. Labour code - Article R.241-50, decree of 11.07.1977. France. INRS, Maladies Professionnelles, Table of Work-Related Illnesses

16. OTHER INFORMATION

R-phrases(s)

	Not classified.
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

MSDS Version Number	:	1.0
MSDS Effective Date	:	18.06.2010
MSDS Revisions	:	A vertical bar () in the left margin indicates an amendment from the previous version.
MSDS Regulation	:	Regulation 1907/2006/EC
MSDS Distribution	:	The information in this document should be made available to all who may handle the product.
Disclaimer	:	This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Material Safety Data Sheet**1. MATERIAL AND COMPANY IDENTIFICATION**

Material Name : Shell Tellus Oil T 32
Uses : Hydraulic oil

Manufacturer/Supplier : SOPUS Products
PO BOX 4427
Houston, TX 77210-4427
USA

MSDS Request : 877-276-7285

Emergency Telephone Number

Spill Information : 877-242-7400

Health Information : 877-504-9351

2. COMPOSITION/INFORMATION ON INGREDIENTS

Highly refined mineral oils and additives.

The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

3. HAZARDS IDENTIFICATION

Emergency Overview	
Appearance and Odour	: Amber. Liquid at room temperature. Slight hydrocarbon.
Health Hazards	: High-pressure injection under the skin may cause serious damage including local necrosis.
Safety Hazards	: Not classified as flammable but will burn.
Environmental Hazards	: Not classified as dangerous for the environment.

Health Hazards : Not expected to be a health hazard when used under normal conditions.

Health Hazards**Inhalation**

: Under normal conditions of use, this is not expected to be a primary route of exposure.

Skin Contact

: Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.

Eye Contact

: May cause slight irritation to eyes.

Ingestion

: Low toxicity if swallowed.

Other Information

: High-pressure injection under the skin may cause serious damage including local necrosis. Used oil may contain harmful impurities.

Signs and Symptoms

: Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection. Ingestion may result in nausea, vomiting and/or diarrhoea.

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- Aggravated Medical Condition** : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Skin.
- Environmental Hazards** : Not classified as dangerous for the environment.
- Additional Information** : Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

4. FIRST AID MEASURES

- General Information** : Not expected to be a health hazard when used under normal conditions.
- Inhalation** : No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
- Skin Contact** : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop. Obtain medical attention even in the absence of apparent wounds.
- Eye Contact** : Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
- Ingestion** : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
- Advice to Physician** : Treat symptomatically. High pressure injection injuries require prompt surgical intervention and possibly steroid therapy, to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

- Flash point** : Typical 210 °C / 410 °F (COC)
- Upper / lower Flammability or Explosion limits** : Typical 1 - 10 %(V)(based on mineral oil)
- Auto ignition temperature** : > 320 °C / 608 °F
- Specific Hazards** : Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds.

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- Suitable Extinguishing Media** : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
- Unsuitable Extinguishing Media** : Do not use water in a jet.
- Protective Equipment for Firefighters** : Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe all relevant local and international regulations.

- Protective measures** : Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
- Clean Up Methods** : Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.
- Additional Advice** : Local authorities should be advised if significant spillages cannot be contained.

7. HANDLING AND STORAGE

- General Precautions** : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
- Handling** : Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
- Storage** : Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Storage Temperature: 0 - 50 °C / 32 - 122 °F
- Recommended Materials** : For containers or container linings, use mild steel or high density polyethylene.
- Unsuitable Materials** : PVC.
- Additional Information** : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
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Oil mist, mineral	ACGIH	TWA(Mist.)		5 mg/m3	
Oil mist, mineral	ACGIH	STEL(Mist.)		10 mg/m3	

Exposure Controls : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

Personal Protective Equipment : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory Protection : No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65°C(149 °F)].

Hand Protection : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Eye Protection : Wear safety glasses or full face shield if splashes are likely to occur.

Protective Clothing : Skin protection not ordinarily required beyond standard issue work clothes.

Monitoring Methods : Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.

Environmental Exposure Controls : Minimise release to the environment. An environmental assessment must be made to ensure compliance with local

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environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Amber. Liquid at room temperature.
Odour	: Slight hydrocarbon.
pH	: Not applicable.
Initial Boiling Point and Boiling Range	: > 280 °C / 536 °F estimated value(s)
Pour point	: Typical -39 °C / -38 °F
Flash point	: Typical 210 °C / 410 °F (COC)
Upper / lower Flammability or Explosion limits	: Typical 1 - 10 %(V) (based on mineral oil)
Auto-ignition temperature	: > 320 °C / 608 °F
Vapour pressure	: < 0.5 Pa at 20 °C / 68 °F (estimated value(s))
Density	: Typical 872 kg/m ³ at 15 °C / 59 °F
Water solubility	: Negligible.
n-octanol/water partition coefficient (log Pow)	: > 6 (based on information on similar products)
Kinematic viscosity	: Typical 32 mm ² /s at 40 °C / 104 °F
Vapour density (air=1)	: > 1 (estimated value(s))
Evaporation rate (nBuAc=1)	: Data not available

10. STABILITY AND REACTIVITY

Stability	: Stable.
Conditions to Avoid	: Extremes of temperature and direct sunlight.
Materials to Avoid	: Strong oxidising agents.
Hazardous Decomposition Products	: Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on data on the components and the toxicology of similar products.
Acute Oral Toxicity	: Expected to be of low toxicity: LD50 > 5000 mg/kg , Rat
Acute Dermal Toxicity	: Expected to be of low toxicity: LD50 > 5000 mg/kg , Rabbit
Acute Inhalation Toxicity	: Not considered to be an inhalation hazard under normal conditions of use.
Skin Irritation	: Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Irritation	: Expected to be slightly irritating.
Respiratory Irritation	: Inhalation of vapours or mists may cause irritation.
Sensitisation	: Not expected to be a skin sensitiser.
Repeated Dose Toxicity	: Not expected to be a hazard.
Mutagenicity	: Not considered a mutagenic hazard.
Carcinogenicity	: Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC). Other components are not known to be associated with carcinogenic

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effects.

- Reproductive and Developmental Toxicity** : Not expected to be a hazard.
- Additional Information** : Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible. High pressure injection of product into the skin may lead to local necrosis if the product is not surgically removed.

12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

- Acute Toxicity** : Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.
- Mobility** : Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.
- Persistence/degradability** : Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.
- Bioaccumulation** : Contains components with the potential to bioaccumulate.
- Other Adverse Effects** : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

13. DISPOSAL CONSIDERATIONS

- Material Disposal** : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.
- Container Disposal** : Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
- Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

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14. TRANSPORT INFORMATION

US Department of Transportation Classification (49CFR)

This material is not subject to DOT regulations under 49 CFR Parts 171-180.

IMDG

This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)

This material is not classified as dangerous under IATA regulations.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Federal Regulatory Status

Notification Status

EINECS	All components listed or polymer exempt.
TSCA	All components listed.
DSL	All components listed.

SARA Hazard Categories (311/312)

No SARA 311/312 Hazards.

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This material does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

NFPA Rating (Health, Fire, Reactivity)	:	0, 1, 0
MSDS Version Number	:	1.1
MSDS Effective Date	:	06/30/2009

Material Safety Data Sheet

- MSDS Revisions** : A vertical bar (|) in the left margin indicates an amendment from the previous version.
- MSDS Regulation** : The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
- MSDS Distribution** : The information in this document should be made available to all who may handle the product.
- Disclaimer** : The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.