

## Attachment G

# *Resources Use & Energy Consumption*

- G.1 Raw Materials, Substances, Preparations and Energy
- G.2 Energy Efficiency

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## **G.1 RAW MATERIALS AND PRODUCT**

With the exception of the wastes describes in Section H of this application, other materials, intermediates and products used on site comprise of fuel (diesel, heating oil), hydraulic oil, engine oil, thinners, transmission fluid, detergent, Ad-Blue, coolants, water and lubricants for the vehicles and plant.

All plant associated liquids are stored in a bunded area within the maintenance garage. Bulk fuel storage at the site is located within tanks on-site, which are complete with integrity certificates.

Material Safety Data Sheets for all these chemicals are retained on-site. If new chemicals are ordered, an MSDS is requested with the first delivery of the product.

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TOTAL

## Safety Data Sheet

Product name : **MULTIS EP 2** Page : 1/6  
 SDS n° :31157-33 Version :8.00 Version of :2003-08-04  
This sheet supersedes the one dated :2001-08-09

### PRODUCT LABELS

LABELLING (standard or EU): Not concerned  
 R-phrases : None  
 S-phrases : None  
 TRANSPORT LABELLING: Not applicable.

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

Name of the product : **MULTIS EP 2**  
 Code No. : **626**  
 Product application : **Lubricating grease**  
 Supplier : **TOTAL LUBRIFIANTS**  
**Le Diamant B**  
**16, rue de la République**  
**92922 Paris La Défense - France**  
**Tel: +33 (0)1 41 35 40 00**  
**Fax: +33 (0)1 41 35 84 31**  
 Emergency telephones : **ORFILA / Tel : 01 45 41 59 59**  
 See local details at end of sheet :

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### 2. COMPOSITION/INFORMATION ON INGREDIENTS

#### PREPARATION

Chemical nature : The product is made from refined mineral base oils and synthetic oils in which the polycyclic aromatic hydrocarbons (PCA or P14) content, measured by IP 346, is less than 3%.

Substances presenting a health hazard	EC No.	CAS No.	Content	Symbol(s)	R-phrases
Zinc alkyl dithiophosphate	272-028-3	68649-42-3	<1,5 %	Xi ,N	R-38, 41, 51/53

See section 16 for explanations of R-phrases :

### 3. HAZARDS IDENTIFICATION

Health effects : **None known to us for normal use.**  
**Under normal conditions of use, the product holds no danger of intoxication**  
 Environmental impact : **Do not reject this product into the environment**  
 Physico-chemical hazards : **No specific risk of fire or explosion under normal conditions of use**

### 4. FIRST AID MEASURES

IN CASE OF SERIOUS OR PERSISTENT MANIFESTATIONS, CALL A DOCTOR OR EMERGENCY MEDICAL CARE.

Inhalation : **Inhalation of heavy concentrations of vapour, fumes or spray, may cause mild irritation of the throat.**  
**Transport the person into fresh air, keep warm and allow to rest.**  
 Ingestion : **Possible risk of vomiting and diarrhoea.**  
**Do not induce vomiting to avoid the risk of aspiration into the respiratory tract.**



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Skin contact : Immediately remove all soiled or stained clothing.  
Wash the affected area immediately and repeatedly with soap and water.  
If the skin is exposed to high-pressure spray, the product may enter the human organism. In all such cases the affected person must be taken to hospital, even if no sign of injury can be detected.

Eye contact : Keep eyes open and rinse immediately and repeatedly with water for at least 15 minutes.

### 5. FIRE FIGHTING MEASURES

Flash point:  
See heading 9

Extinguishing media :  
- suitable:  
Foam, carbon dioxide (CO<sub>2</sub>), powder.  
- not recommended:  
do not use water jets (stick jets) for extinguishing fire since they could help to spread the flames.

Specific hazards : Incomplete combustion and thermal decomposition produce gases of varying toxicity such as CO, CO<sub>2</sub>, various hydrocarbons, aldehydes and soot. These may be highly dangerous if inhaled.

Protective measures for firefighters : Insulated breathing apparatus must be worn in confined premises with heavy concentrations of fumes and gases.

### 6. ACCIDENTAL RELEASE MEASURES

See sections 8 and 13.

After spillage / leakage :  
- On the soil:  
Surfaces on which the product has been spilled may become slippery.  
Do not allow the product to enter sewers or rivers or contaminate the soil.  
Recover with mechanical means such as pumps and skimmers.  
Contain and collect the spilled product with sand or any other inert absorbant material.  
In case of spillage, contact the competent authorities if the situation cannot be brought under control rapidly and efficiently.  
- On water:  
Floating absorbant material, then mechanical recovery.  
If the product is spilled in a river or in the sewers, notify the authorities of the possible presence of floating items.

### 7. HANDLING AND STORAGE

HANDLING :

Prevention of user exposure : Ventilate extensively if the formation of vapours, fumes, mists or aerosol is a risk.  
Make all the necessary arrangements in order to reduce exposure risk, notably to products in use or to wastes.  
Keep away from combustive substances; keep away from food and beverages.

Prevention of fire and explosion : Empty containers may contain flammable or explosive vapours.  
There is a fire hazard associated with rags, paper or any other material used to remove spills which become soaked with product.  
Avoid accumulate of these: they are to be disposed off safely after use.

Precautions : Avoid static electricity build up with connection to earth.  
Set up machinery and equipment so as to avoid the risk of accidental spills or splashes onto hot machine parts and electrical contacts (on joint failure, for example).

STORAGE :



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Product name :

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Version :8.00

Version of :2003-08-04

This sheet supersedes the one dated :2001-08-09

Technical measures :	Make the necessary arrangements to prevent water and soil pollution.
Storage precautions :	- Suitable: Store at room temperature, protected against contact with water and moisture, and away from any source of ignition. Keep containers closed when not in use - To be avoided: Do not store exposed to the elements.
Incompatible products :	Dangerous reaction with strong oxidizing agents.
Packaging materials :	- Recommended: Use only hydrocarbon-resistant containers, joints, pipes, etc. Keep in original container if possible. Otherwise, transfer all indications on the regulatory label to the new container.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Technical measures :	Use the product in a properly ventilated atmosphere. When working on enclosed place (tanks, reservoirs...), make sure that atmosphere is not suffocating and/or wear recommend equipment.
Occupational exposure limit :	. oil mist : 10mg/m3, for 15 minutes . oil mist : 5mg/m3, for 8 hours
Hand protection :	Impermeable hydrocarbon-proof gloves. recommended material: nitrile , neoprene. The demands on the gloves are determined by the condition in practice (f.e. multiple use, mechanical load, temperature, strength and duration of exposition). Before choosing suitable gloves, it is recommended for the user to test the gloves. The breaking-through times of the same type of glove of different manufacturers can be very different - even if the layer thickness is similar. Therefore the breaking-through times have to be found out by the manufacturer of the protection glove himself.
Eye protection :	Goggles, in case of risk of splashing.
Skin and body (other than the hands) protection :	As required, wear a face mask, hydrocarbon-proof clothing, and safety boots (when handling drums). Don't wear ring, watch or similar thing which will be able to hold the product and may give rise to some skin diseases.
Hygienic work practices :	Avoid prolonged and repeated contact with the skin, especially with used or waste product Immediately remove all soiled or stained clothing. If the product comes into contact with the skin, wash the affected area immediately and copiously with soap and water. Use no abrasives, solvents or fuels. Do not use cloths stained with the product to dry hands. Dont put the product-soaked rags in the pockets of working clothes. Do not eat, drink or smoke while handling the product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance :	Pasty
Colour :	Light brown.
Odour :	Characteristic
Density/specific gravity :	900 kg/m3 Temperature (°C) 15
Flash point :	> 200 ° C (ASTM D 93)



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Comments on autoignition temperature : This temperature may be significantly lower under particular conditions (slow oxidation on finely divided materials...).

Comments on explosivity : Not applicable  
Drop point: > 190 °C (NF T 60-102)

Solubility :  
- in water :  
Insoluble and immiscible.  
- in organic solvents :  
Soluble in many common solvents.

Penetration index : 280 NLGI 2 (1/10 mm) at 25°C

### 10. STABILITY AND REACTIVITY

Stability : The product is stable at normal storage, handling and use temperatures.

Conditions to avoid : Heat, sparks, ignition points, flames, static electricity.

Materials to avoid : Avoid contact with strong oxidizers

Hazardous decomp. products : Incomplete combustion and thermal decomposition produce more or less toxic gases such as CO, CO<sub>2</sub>, various hydrocarbons, aldehydes and soot.

### 11. TOXICOLOGICAL INFORMATION

Acute toxicity / Local effect :

Inhalation, comments:  
- Inhalation:  
Risk is improbable under normal conditions of use  
Inhalation of important concentration of vapour or aerosols may cause irritation of the upper respiratory tract.

Skin contact, comments:  
- Contact with skin :  
Risk is improbable under normal conditions of use.  
If the skin is exposed to high-pressure spray, the product may enter the human organism. In all such cases the affected person must be taken to hospital, even if no sign of injury can be detected

Ingestion, comments:  
- Ingestion :  
In case of ingestion of small quantities, no important effect observed. in case of ingestion of larger amounts: abdominal pain, diarrhea, ...

#### CHRONIC TOXICITY OR LONG-TERM TOXICITY :

Skin contact : Characteristic skin affections (oil blisters) may develop following prolonged and repeated exposure through contact with stained clothing

Sensitization : To our knowledge, the product does not cause aggravated sensitivity.

### 12. ECOLOGICAL INFORMATION

Comments about ecotoxicity : Experimental data on the finished product are not available.  
It is considered to present a little danger for aquatic life.  
no information available for used product

Mobility :  
- Air:  
there is a slow loss by evaporation.  
- Soil:  
Given its physical and chemical characteristics, the product has no soil mobility.  
- Water:  
The product is insoluble; it spreads on the surface of the water

Persistence and degradability : No experimental information about the finished product.  
However the "mineral oil" fraction of the new product is intrinsically biodegradable.



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### 13. DISPOSAL CONSIDERATIONS

Waste disposal :

Dispose of in a safe manner, in accordance with local regulations.  
If need be, collection by an authorized waste contractor and regeneration or incineration in an approved installation

Waste class :

The waste key mentioned here represents only a recommendation. Responsible for the correct specification of the waste key is the waste producer. The specification of the waste key should be in arrangement with the responsible waste disposer. The waste key is depending on the composition of the product at the time of disposal.  
12 01 12

Disposal of contaminated packaging :

Proceed in compliance with the prevailing regulations.

National regulations :

- France  
List of wastes: JOCE L349 of 16.02.2001.  
Law No. 75-633 of 15.07.75 amended, relative to the elimination of wastes and the recovery of materials.  
Regulations concerning the collection of used oils:  
Decree 79-981 of 21.11.79 and rules of 28.01.99 relative to their collection and the conditions for their elimination.  
Law No. 88-1261 of 30.12.88 concerning the import, export and transit of wastes.  
Decree No. 77-254 of 08.03.77 relative to the regulation for the dumping of oils and lubricants into surface waters.

### 14. TRANSPORT INFORMATION

Not concerned by the transport regulations below.

Road (ADR) / Rail (RID) :

Class :

Not restricted for transport.

Transport by barge (ADNR) :

Marine (IMO-IMDG) :

Air (ICAO/IATA) :

### 15. REGULATORY INFORMATION

Not applicable

Risk phrases :

None

Safety phrases :

None

EU directives :

Hazardous preparations directive 1999/45/EC modified (Directive 2001/60/EC).

Social Security code :

Table of occupational illnesses and diseases No. 36  
- Art. L 461-6, Art. D 461-1, appendix A, No. 601.

Labor code :

- Art. R 241-50, decree of 07.11.1977.

### 16. OTHER INFORMATION

For France, in case of poisoning call the Antipoison Centre (if possible in your area) and/or the SAMU (15), see ORFILA number below - Tel : Angers 02.41.48.21.21 - Bordeaux 05.56.96.40.80 - Lille 03.20.44.44.44 - Lyon 04.72.11.69.11 - Marseille 04.91.75.25.25 - Nancy 03.83.32.36.36 - Paris 01.40.05.48.48 - Rennes 02.99.59.22.22 - Strasbourg 03.88.37.37.37 - Toulouse 05.61.77.74.47

This sheet is in compliance with the standards defined by the directives 91/155/CEE, 93/112/CEE, 2001/58/CE and the article 14 of the directive 1999/45/EC.



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Explanations of R-phrases in section 2 :  
R-38 Irritating to skin.  
R-41 Risk of serious damage to eye.  
R-51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Revision date: 2003-08-04

Supersedes the data sheet of: 2001-08-09

\* Information revised since the previous version of the SDS :

SDS No. : p055-0000567-91

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## PRODUCT DATA SHEET

(This booklet incorporates the Specification and M.S.D.S.)

**PRODUCT**            **GREENOX® (AdBlue®)**

CAS NO.                57-13-6

TARIFF NO.

U.N NO.
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EINECS NO.            200-315-5

IMCO CLASS
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HAZARDS

SPECIFICATION REFERENCE	ADBL/2	DATE AUG 06
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REFERENCE NO.	ADBL/3	DATE OCT 06
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PREVIOUS EDITION.	ADBL/2	DATE AUG 06
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## PRODUCT SPECIFICATION

Product Name Greenox® (AdBlue®)  
 Alternative Name  
 Product Grade

### SALES SPECIFICATION

Characteristics	Unit	Min	Max	Typical Value
Urea Content	Weight %	31.8	33.2	32.5
Density	g/cm <sup>3</sup>	1.087	1.093	1.0895
Refractive Index at 20°C		1.3814	1.3843	1.3829
Alkalinity as NH <sup>3</sup>	%	-	0.2	
Biuret	%	-	0.3	
Aldehydes	mg/kg	-	5	
Insolubles	mg/kg	-	20	
Phosphate (PO <sub>4</sub> )	mg/kg	-	0.5	
Calcium	mg/kg	-	0.5	
Iron	mg/kg	-	0.5	
Copper	mg/kg	-	0.2	
Zinc	mg/kg	-	0.2	
Chromium	mg/kg	-	0.2	
Nickel	mg/kg	-	0.2	
Aluminium	mg/kg	-	0.5	
Magnesium	mg/kg	-	0.5	
Sodium	mg/kg	-	0.5	
Potassium	mg/kg	-	0.5	

Greenox® conforms to DIN 70070

#### Storage

To maintain the product quality it is recommended that AdBlue® is stored below 30°C and out of direct sunlight

#### Shelf Life

12 months providing the above conditions are observed

#### Freezing

Adblue® will begin to freeze at -11.5°C; this does not affect the product quality or strength. The liquid phase of a partially frozen solution will still be at the required concentration and may continue to be used. The remaining frozen portion may be used after allowing to thaw

### NOTES

#### Exclusion of Liability

Information contained in this publication is accurate to the best of the knowledge and belief of Tennants.

Any information or advice obtained from Tennants otherwise than by means of this publication and whether relating to Tennants materials or other materials, is also given in good faith. However, it remains at all times the responsibility of the customer to ensure that Tennants materials are suitable for the particular purpose intended.

Tennants accepts no liability whatsoever (except as otherwise provided by law) arising out of the use of information supplied, the application, adaptation or processing of the products described herein, the use of other materials in lieu of Tennants materials or the use of Tennants materials in conjunction with such other materials.

#### Health and Safety

A Material Safety Data Sheet has been issued describing the health, safety and environmental properties of this product, identifying the potential hazards and giving advice on the handling precautions and emergency procedures. This must be consulted fully before handling, storage and use.

SAFETY DATA SHEET	
<b>1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY</b>	
Product:	Greenox® (AdBlue®)
COMPANY:	TENNANTS DISTRIBUTION LIMITED
	Hazelbottom Road Botany Way
	Cheetham Purfleet
	Manchester Essex
	M8 0GR RM19 1SN
	Tel No. 44(0)161 205 4454 Tel No. 44(0)1708 860075
	Fax No. 44(0)161 203 4298 Tel No. 44(0)1708 860074
	Emergency Tel No. 01865 407333
<b>2. COMPOSITION/INFORMATION ON INGREDIENTS</b>	
Composition	Urea
Concentration	32.5%
CAS No.	57-13-6
EINECS No.	200-315-5
Further Information	Aqueous solution of Urea
<b>3. HAZARDS IDENTIFICATION</b>	
Main Hazards	No specific hazards related to the product
<b>4. FIRST AID MEASURES</b>	
First Aid – Eyes	Rinse immediately with plenty of water. Also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician
First Aid – Skin	Wash off with plenty of water. Take off all contaminated clothing
First Aid – Ingestion	Rinse mouth with water. Drink plenty of water. Do not induce vomiting. Call a physician
First Aid – Inhalation	Move to fresh air
<b>5. FIRE FIGHTING MEASURES</b>	
Extinguishing Media	The product itself does not burn. Standard procedures for chemical fires
Special Hazards In A Fire	Heating can release hazardous gases (NO <sub>x</sub> , HCN, NH <sub>3</sub> )
Protective Equipment for Fire Fighting	Wear self contained breathing apparatus and splash protection suit
<b>6. ACCIDENTAL RELEASE MEASURES</b>	
Personal Precautions	Avoid contact with skin and eyes. Slipping hazard
Environmental Precautions	Prevent product from entering drains and surface and ground water
Measures For Clean Up	Take up mechanically and collect in suitable container for disposal. Dispose of in compliance with local and national regulations. After cleaning, flush away traces with water
<b>7. HANDLING AND STORAGE</b>	
Safe Handling Advice	Avoid contact with skin and eyes
Storage	Keep containers tightly closed in a dry and cool place. Keep away from strong oxidising agents (permanganates, chromates, nitrates, nitrites, chlorine and hypochlorites)
<b>8. EXPOSURE CONTROLS/PERSONAL PROTECTION</b>	
Occupational Exposure Limits	No specific exposure limit determined for the substance
Occupational Exposure Controls	Avoid contact with skin and eyes. Wash hands before breaks and immediately after handling the product
Hand Protection	PVC, latex or other plastic material/rubber gloves. Do not wear leather gloves
Eye Protection	Goggles
Skin And Body Protection	Do not wear leather shoes
<b>9. PHYSICAL AND CHEMICAL PROPERTIES</b>	
Physical State	Liquid, clear, colourless – yellowish; possibly slightly ammoniacal odour
pH	10 (10% solution)
Boiling Point/Range	103°C
Flash Point	Not applicable
Explosive Properties	
Lower Explosion Limit	Not applicable
Upper Explosion Limit	Not applicable
Vapour Pressure	No data available
Relative Density	1.09 g/ml (20°C)

Solubility	
Water Solubility	Fully soluble
Fat Solubility (Solvent – Oil to be specified)	No data available
Partition Co-Efficient (n-octanol/water)	Urea: Log Pow = -2.59 (20-25°C)
Viscosity	ca. 1.4 mPa.s (25°C)
Further Information	Crystallisation temperature = -11°C
<b>10. STABILITY AND REACTIVITY</b>	
Hazardous Decomposition Products	Strong oxidising agents, (permanganates, chromates, nitrates, nitrites, chlorine, hypochlorites) Heating can release hazardous gases (NO <sub>x</sub> , HCN, NH <sub>3</sub> )
<b>11. TOXICOLOGICAL INFORMATION</b>	
Acute Oral Toxicity	LD50/Oral/Rat = 14300 mg/kg
Skin Irritation	LD50/Oral/Mouse = 11500 mg/kg
Eye Irritation	May cause skin irritation
Genotoxicity In Vitro	Urea has not caused sensitisation on laboratory animals No adverse health effects are known or expected under normal use
<b>12. ECOLOGICAL INFORMATION</b>	
Aquatic Toxicity	LC50/96h/Bairdius barna >9100 mg/l LC50/24h/daphnia >10000 mg/l
Mobility	Water soluble. Adsorption to soil is low
Biological Degradability	Biodegradable
Bio Accumulative Potential	Accumulation is unlikely, log Pow (urea) = -2.59
<b>13. DISPOSAL CONSIDERATIONS</b>	
Product Disposal	In accordance with local and national regulations
<b>14. TRANSPORT INFORMATION</b>	
Not regulated	
<b>15. REGULATORY INFORMATION</b>	
Not classified	
<b>16. OTHER INFORMATION</b>	
<p>©Greenox is a registered trademark of Kemira Growth Care</p> <p>© Adblue is a registered trademark of the Verband der Automobilindustrie e.V (VDA)</p> <p>Further information has been added to page 2. The remainder of the document is unchanged</p> <p>Revision Date: 27/10/06</p>	

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## Safety Data Sheet

Product name :

EP 80W-90

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SDS n°32373-39

Version :1.00

### PRODUCT LABELS

LABELLING (standard or EU): Not concerned  
R-phrases : None  
S-phrases : None  
TRANSPORT LABELLING: Not applicable.

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

Name of the product : EP 80W-90  
Code No. : C31  
Product application : Transmission fluid  
Supplier : TOTAL LUBRIFIANTS  
Le Diamant B  
16, rue de la République  
92922 Paris La Défense - France  
Tel: +33 (0)1 41 35 40 00  
Fax: +33 (0)1 41 35 84 71  
Emergency telephones : ORFILA / Tel: 01.45.42.59.59  
See local details at end of sheet :

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

#### PREPARATION

Chemical nature : Petroleum-derived severely refined mineral-base product in which the polycyclic aromatic hydrocarbons (PCA or PAH) content, measured by IP 346, is less than 3%

Substances presenting a health hazard	EC No.	CAS No.	Content	Symbol(s)	R-phrases
Alkylphosphoric acid ester amine salt			<1,5 %	N	
Alkenyl amine			<0,4 %	C ,N	
Substituted thiadiazol			<0,2 %	Xi	R-43

See section 16 for explanations of R-phrases :

### 3. HAZARDS IDENTIFICATION

Health effects : Under normal conditions of use, the product holds no danger of intoxication  
Environmental impact : Do not reject this product into the environment  
Physico-chemical hazards : No specific risk of fire or explosion under normal conditions of use

### 4. FIRST AID MEASURES

IN CASE OF SERIOUS OR PERSISTENT MANIFESTATIONS, CALL A DOCTOR OR EMERGENCY MEDICAL CARE.

Inhalation : Inhalation of heavy concentrations of vapour, fumes or spray, may cause mild irritation of the throat.  
Transport the person into fresh air, keep warm and allow to rest.



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Ingestion :	Possible risk of vomiting and diarrhoea. Do not induce vomiting to avoid the risk of aspiration into the respiratory tract. Give nothing to drink
Skin contact :	Immediately remove all soiled or stained clothing. Wash the affected area immediately and repeatedly with soap and water.
Eye contact :	Keep eyes open and rinse immediately and repeatedly with water for at least 15 minutes.
Aspiration :	If the product is believed to have entered the lungs (in case of vomiting, for example), take the person to hospital for immediate care.

### 5. FIRE FIGHTING MEASURES

Flash point:  
heading 9

Extinguishing media :

- suitable:  
Foam, carbon dioxide (CO<sub>2</sub>), powder.  
- not recommended:  
do not use water jets (stick jets) for extinguishing fire since they could help to spread the flames.

Specific hazards :

Incomplete combustion and thermolysis produce gases of varying toxicity such as CO, CO<sub>2</sub>, various hydrocarbons, aldehydes and soot. These may be highly dangerous if inhaled.

Protective measures for firefighters :

Insulated breathing apparatus must be worn in confined premises with heavy concentrations of fumes and gases.

### 6. ACCIDENTAL RELEASE MEASURES

See sections 8 and 13.

After spillage / leakage :

- On the soil:  
Surface on which the product has been spilled may become slippery. Do not allow the product to enter sewers or rivers or contaminate the soil. Recover with mechanical means such as pumps and skimmers. Contain and collect the spilled product with sand or any other inert absorbant material.  
- On water:  
Floating absorbant material, then mechanical recovery. If the product is spilled in a river or in the sewers, notify the authorities of the possible presence of floating items.

Spill cleanup methods :

- Recovery:  
Using physical facilities (pumping, skimming, etc.); contain the spillage and recover using sand or any other type of inert absorbent material: do not dump to the drain.  
- Elimination:  
Hand over contaminated materials to an approved collector - see also section 13.

### 7. HANDLING AND STORAGE

HANDLING :

Prevention of user exposure :

Ventilate extensively if the formation of vapours, fumes, mists or aerosol is a risk.  
Make all the necessary arrangements in order to reduce exposure risk, notably to products in use or to wastes.  
Keep away from combustive substances; keep away from food and beverages.

Prevention of fire and explosion :

Empty containers may contain flammable or explosive vapours.  
There is a fire hazard associated with rags, paper or any other material used to remove spills which become soaked with product.  
Avoid accumulate of these: they are to be disposed off safely after use.

Precautions :

Avoid static electricity build up with connection to earth.  
Set up machinery and equipment so as to avoid the risk of accidental spills or splashes onto hot machine parts and electrical contacts (on joint failure, for example).



## Safety Data Sheet

Product name :  
SDS n°32373-39

EP 80W-90  
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### STORAGE :

Technical measures : Make the necessary arrangements to prevent water and soil pollution.

Storage precautions :  
- Suitable:  
Store at room temperature, protected against contact with water and moisture, and away from any source of ignition.  
Keep containers closed when not in use  
- To be avoided:  
Do not store exposed to the elements.

Incompatible products : Dangerous reaction with strong oxidizing agents.

Packaging materials :  
- Recommended:  
Use only hydrocarbon-resistant containers, joints, pipes, etc.  
Keep in original container if possible.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Technical measures : Use the product in a properly ventilated atmosphere.  
When working on enclosed place (tanks, reservoirs...), make sure that atmosphere is not suffocating and/or wear recommend equipment.

Occupational exposure limit :  
. oil mist : 10mg/m<sup>3</sup>, for 15 minutes  
. oil mist : 5mg/m<sup>3</sup>, for 8 hours

LT Exp 8 Hrs : 5 mg/m<sup>3</sup>

ST Exp 15 Min : 10 mg/m<sup>3</sup>

Hand protection : Impermeable hydrocarbon-proof gloves.  
recommended material: nitrile , neoprene.

Eye protection : Goggles in case of risk of splashing.

Skin and body (other than the hands) protection : As required, wear a face mask, hydrocarbon-proof clothing, and safety boots (when handling drums).  
Don't wear ring, watch or similar thing which will be able to hold the product and may give rise to some skin diseases.

Hygienic work practices : Avoid prolonged or repeated contact with the skin, particularly as regards used or waste oil.  
Immediately remove all soiled or stained clothing.  
If the product comes into contact with the skin, wash the affected area immediately and copiously with soap and water.  
Use no abrasives, solvents or fuels.  
Do not use cloths stained with the product to dry hands.  
Dont put the product-soaked rags in the pockets of working clothes.  
Do not eat, drink or smoke while handling the product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid.

Colour : Yellow.

Odour : Characteristic.

Density/specific gravity : 893 kg/m<sup>3</sup>  
Temperature (°C) 15°C

Flash point : > 200 ° C (ASTM D 93)

Température d'auto-inflammation : > 250 ° C (ASTM E 659)



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Comments on autoignition temperature :	This temperature may be significantly lower under particular conditions (slow oxidation on finely divided materials...) Pour point: < -24 °C (ASTM D 97)
Solubility :	Insoluble in water. Soluble in many common solvents.
Partition coefficient (log Pow) :	Log Pow > 6 Temperature (°C) (20°C)
Viscosity :	14.8 mm <sup>2</sup> /s Temperature (°C) 100

### 10. STABILITY AND REACTIVITY

Stability :	The product is stable at normal storage, handling and use temperatures.
Conditions to avoid :	Heat (temperatures above flash point), sparks, ignition points, flames, static electricity
Materials to avoid :	Avoid contact with strong oxidizing
Hazardous decomp. products :	Incomplete combustion and thermolysis produce more or less toxic gases such as CO, CO <sub>2</sub> , various hydrocarbons, aldehydes and soot.

### 11. TOXICOLOGICAL INFORMATION

Acute toxicity / Local effect :	
Inhalation, comments:	- Inhalation : Risk is improbable under normal conditions of use Inhalation of important concentration of vapour or aerosols may cause irritation of the upper respiratory tract.
Skin contact, comments:	Risk is improbable under normal conditions of use.
Ingestion, comments:	- Ingestion : In case of ingestion of small quantities, no important effect observed. in case of ingestion of larger amounts: abdominal pain, diarrhea, ...

#### CHRONIC TOXICITY OR LONG-TERM TOXICITY :

Skin contact :	Characteristic skin affections (oil blisters) may develop following prolonged and repeated exposure through contact with stained clothing
Sensitization :	To our knowledge, the product does not cause aggravated sensitivity.

### 12. ECOLOGICAL INFORMATION

Comments about ecotoxicity :	Experimental data on the finished product are not available. It is considered to present a little danger for aquatic life. no information available for used product
Mobility :	- Air: there is a slow loss by evaporation. - Ground: Given its physical and chemical characteristics, the product generally shows little mobility in the ground. - Water: The product is insoluble; it spreads on the surface of the water
Persistence and degradability :	No experimental information about the finished product. However the "mineral oil" fraction of the new product is intrinsically biodegradable. Some components of the product may not be biodegradable.





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### 13. DISPOSAL CONSIDERATIONS

Waste disposal : Dispose of in a safe manner, in accordance with local regulations.  
If need be, collection by an authorized waste contractor and regeneration or incineration in an approved installation

Waste class : 13-02-02 (non-chlorinated engine, gear, lubricating oils)

Disposal of contaminated packaging : Proceed in compliance with the prevailing regulations.

National regulations : - France  
Notice of 11.11.1997 concerning the nomenclature for waste.  
List of wastes: JOCE L349 of 16.02.2001.  
Law No. 75-633 of 15.07.75 amended, relative to the elimination of wastes and the recovery of materials.  
Regulations concerning the collection of used oils:  
Decree 79-981 of 21.11.79 and rules of 28.01.99 relative to their collection and the conditions for their elimination.  
Law No. 88-1261 of 30.12.88 concerning the import, export and transit of wastes.  
Decree No. 77-254 of 08.03.77 relative to the regulation for the dumping of oils and lubricants into surface waters.

### 14. TRANSPORT INFORMATION

Road (ADR) / Rail (RID) :

Class :

Not restricted for transport

Transport by barge (ADNR) :

Marine (IMO-IMDG) :

Air (ICAO/IATA) :

### 15. REGULATORY INFORMATION

Risk phrases :

None

Safety phrases :

None

Other :

- Contains:  
Substituted thiadiazol.  
Alkenyl amine  
Can start an allergic reaction.

EU directives :

Hazardous preparations directive 1999/45/EC modified (Directive 2001/60/EC).

### 16. OTHER INFORMATION

This sheet is in compliance with the standarts defined by the directives 91/155/CEE, 93/112/CEE, 2001/58/CE and the article 14 of the directive 1999/45/EC.

For France, in case of poisoning call the Antipoison Centre (if possible in your area) and/or the SAMU (15), see ORFILA number below - Tel : Angers 02.41.48.21.21 - Bordeaux 05.56.96.40.80 - Lille 03.20.44.44.44 - Lyon 04.72.11.69.11 - Marseille 04.91.75.25.25 - Nancy 03.83.32.36.36 - Paris 01.40.05.48.48 - Rennes 02.99.59.22.22 - Strasbourg 03.88.37.37.37 - Toulouse 05.61.77.74.47

Explanations of R-phrases in section 2 :

R-43 May cause sensitization by skin contact.

\* Information revised since the previous version of the SDS :



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This safety data sheet serves to complete but not to replace the technical product sheets. The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above. It is understood by the user that any use of the product for purposes other than those for which it was designed entails potential risk. The information given herein in no way dispenses the user from knowing and applying all provisions regulating his activity. The user bears sole liability for the precautions required when using the product. The regulatory texts indicated herein are intended to aid the user to fulfil his obligations. This list is not to be considered complete and exhaustive. It is the user's responsibility to ensure that he is subject to no other obligations than those mentioned.

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TOTAL

## Safety Data Sheet

Product name :

ANTIGEL/ANTIFREEZE

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SDS n° :31363-33

Version :2.01

Version of :2005-05-03

This sheet supersedes the one dated :2003-06-30

### PRODUCT LABELS

LABELLING (standard or EU):

Concerned

Symbol(s) :



Symbol(s) :

Xn Harmful

Contains :

Monoethylene-glycol

R-phrases :

R-22 Harmful if swallowed.

S-phrases :

S-2 Keep out of reach of children.  
S-36/37 Wear suitable protective clothing and gloves.  
S-46 If swallowed seek medical advice immediately and show this container or label.

TRANSPORT LABELLING:

Not applicable.

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

Name of the product :

ANTIGEL/ANTIFREEZE

Code No. :

IM

Product application :

Antifreeze/Cooling liquid

Supplier :

TOTAL LUBRIFIANTS  
Le Diamant B  
16, rue de la République  
92922 Paris La Défense - France  
Tel: +33 (0)1 41 35 40 00  
Fax: +33 (0)1 41 35 84 71

Emergency telephones :

ORFILA / Tel : 01.45.42.59.59

See local details at end of sheet :

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

#### PREPARATION

Chemical nature :

Product with ethylene-glycol base

Substances presenting a health hazard	EC No.	CAS No.	Content	Symbol(s)	R-phrases
Monoethylene-glycol		107-21-1	<100	Xn	R-22

See section 16 for explanations of R-phrases :

### 3. HAZARDS IDENTIFICATION

Health effects :

Accidental ingestion may be harmful to the central nervous system  
The product contains an approved repellent (bitter), for the purpose of avoiding the risk of accidental ingestion



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**Environmental impact :** Do not discharge this product into the environment.  
**Physico-chemical hazards :** If overheated, the product may release flammable vapours that can form explosive gas mixtures.  
**Product classification :** Harmful: Xn.  
Harmful if swallowed.

### 4. FIRST AID MEASURES

IN CASE OF SERIOUS OR PERSISTENT CONDITIONS, CALL A DOCTOR OR EMERGENCY MEDICAL CARE.

**Inhalation :** Inhalation of heavy concentrations of vapour, fumes or spray, may cause mild irritation of the throat.  
Transport the person into fresh air, keep warm and allow to rest.

**Ingestion :** Immediately transport to hospital.  
Do not induce vomiting to avoid the risk of aspiration into the respiratory tract.  
Give nothing to drink  
Ingestion, depending on the dose, can cause i.a. abnormal behaviour, unconsciousness, convulsions, respiratory paralysis, pulmonary oedemas, as well as damages to liver and kidneys and can lead, in the worst case, to death. A quick treatment of an ethylene-glycol intoxication, when necessary with haemodialysis, may reduce the toxic effects. Intravenous ethyl alcohol in sodium bicarbonate solution is an approved antitoxin.  
Rinse the mouth.

**Skin contact :** Immediately remove all soiled or stained clothing.  
Wash the affected area immediately and repeatedly with soap and water.

**Eye contact :** Keep eyes open and rinse immediately and repeatedly with water for at least 15 minutes.  
Contact physician if discomfort continues.

**Aspiration :** If the product is believed to have entered the lungs (in case of vomiting, for example), take the person to hospital for immediate care.

### 5. FIRE FIGHTING MEASURES

**Flash point:**  
See heading 9

**Extinguishing media :**  
- suitable:  
Foam, carbon dioxide (CO<sub>2</sub>), powder.  
- not recommended:  
do not use water jets (stick jets) for extinguishing fire since they could help to spread the flames.

**Specific hazards :** Prevent ethylene glycol from decomposing into acetaldehyde, at 500-600°C.  
Vapours can build explosive mixtures with air.

**Protective measures for firefighters :** Insulated breathing apparatus must be worn in confined premises with heavy concentrations of fumes and gases.

**Other :** The combustion residues and contaminated water for fire-fighting have to be disposed according to the local regulations.

### 6. ACCIDENTAL RELEASE MEASURES

See sections 8 and 13.



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Personal protection :

As applicable in view of the risk of exposure, wear suitable protective clothing, gloves, goggles, and boots.  
Whenever there is a possibility of contact, wear liquid-proof protective clothing that must be cleaned and changed frequently. Remove any stained clothing at once and have dry cleaned.  
Ensure good ventilation.  
Avoid the inhalation of vapours.

After spillage / leakage :

- On the soil:  
Surfaces on which the product has been spilled may become slippery.  
Do not allow the product to enter sewers or rivers or contaminate the soil.  
Recover with mechanical means such as pumps and skimmers.  
In case of spillage, contact the competent authorities if the situation cannot be brought under control rapidly and efficiently.  
- On water:  
If the product has penetrated into a river or a sewer, notify the authorities.

### 7. HANDLING AND STORAGE

HANDLING :

Prevention of user exposure :

Ventilate extensively if the formation of vapours, fumes, mists or aerosol is a risk.  
Keep away from combustible substances; keep away from food and beverages.

Prevention of fire and explosion :

Empty containers may contain flammable or explosive vapours.  
There is a fire hazard associated with rags, paper or any other material used to remove spills which become soaked with product.  
Avoid accumulation of these: they are to be disposed off safely after use.

Precautions :

Avoid static electricity build up with connection to earth.  
Set up machinery and equipment so as to avoid the risk of accidental spills or splashes onto hot machine parts and electrical contacts (on joint failure, for example).  
Avoid contact with strong oxidizers.

STORAGE :

Technical measures :

Make the necessary arrangements to prevent water and soil pollution.

Storage precautions :

- Suitable:  
Keep away from food, drink and animal feeding stuffs.  
Store at room temperature, protected against contact with water and moisture, and away from any source of ignition.  
Do not use aluminum containers.  
- To be avoided:  
Do not store exposed to the elements.

Incompatible products :

Dangerous reaction with strong oxidizing agents.

Packaging materials :

- Recommended:  
Use only containers, joints, pipes, etc...made in a material suitable for use with water and glycol.  
Keep in original container if possible.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Technical measures :

Use the product in a properly ventilated atmosphere.  
When working on enclosed place (tanks, reservoirs...), make sure that atmosphere is not suffocating and/or wear recommended equipment.



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Occupational exposure limit :

In France:

Vapours of monoethylene glycol (VLE) : 125 mg/m<sup>3</sup> (50 ppm) for 15 minutes.

Germany:

Vapours of monoethylene glycol (MAK) : Category 1 ; 10ppm , 26mg/m<sup>3</sup>

There is no reason to fear a risk for damage to the developing embryo or foetus when MAK and BAT values are respected.

Risk of skin absorption.

Recommended indicative occupational exposure limit value for the EC according to 2000/39/CE (Official journal of the EC L 142, is currently checked by the AGS for Germany):

- 8h-limit value: 52 mg/m<sup>3</sup> (20 ppm)

- short time limit value: 104 mg/m<sup>3</sup> (40 ppm)

ACGIH (TLV) :

Vapours of monoethylene glycol (TWA) : 39.4ppm , 100mg/m<sup>3</sup>

Vapours of monoethylene glycol (STEL) : 40ppm , 104mg/m<sup>3</sup>

Protective equipment :



Respiratory protection :

If exposure is likely to exceed the occupational exposure limit, in a ventilated space, use approved respiratory protective equipment; in confined spaces, use autonomous breathing apparatus.

Gas cartridge (organic gases, filter A).

Combined gas cartridge (organic gases and dust, filter A/P2).

Pay attention that the time for wearing a filter is limited.

Hand protection :

Use protective gloves.

Check protective gloves for their proper condition prior to each use.

Suitable glove materials (breaking-through time  $\geq$  8h) are:

Polychloroprene - layer thickness 0,5 mm

Nitrile rubber/-latex - layer thickness 0,35 mm

Fluorocarbon rubber (Viton) - layer thickness 0,4 mm

Butyl rubber - layer thickness 0,5 mm

Polyvinyl chloride (PVC) – layer thickness 0,5 mm

Gloves made of natural caoutchouc or latex are not suitable.

All datas are standard values measured at 22 °C and long-term loading

For the product itself are no experimental datas available for the moment.

Permeation times have not been determined by means of practical tests, but by analogy conclusions.

The characteristics of the gloves are determined by the conditions in practice (f.e. multiple use, mechanical load, temperature, strength and duration of exposition).

The break through times of the same type of glove of different manufacturers can be very different - even if the layer thickness is similar. Therefore the break through times have to be found out from the manufacturer of the protective gloves themselves.

Before choosing suitable gloves, it is recommended for the user to test the gloves.

Eye protection :

Goggles, in case of risk of splashing.

Skin and body (other than the hands) protection :

Depending on requirements, face mask, boots, clothing proof against the product, safety shoes (drum handling).

Don't wear rings, watches or anything similar which may be able to hold the product and give rise to skin diseases.



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**Product name :** ANTIGEL/ANTIFREEZE Page : 5/7  
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**Hygienic work practices :** Immediately remove all soiled or stained clothing.  
If the product comes into contact with the skin, wash the affected area immediately and copiously with soap and water.  
Do not use abrasives, solvents or fuels.  
Do not use cloths stained with the product to dry hands.  
Do not put the product-soaked rags into the pockets of working clothes.  
Do not eat, drink or smoke while handling the product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance :** Liquid  
**Colour :** Blue.  
**Odour :** Characteristic.  
**Density/specific gravity :** 1105 - 1135 kg/m3  
Temperature (°C) 15  
**Flash point :** > 100 ° C (ASTM D 93)  
**Température d'auto-inflammation :** Monoethylene glycol > 398 ° C  
**Comments on autoignition temperature :** This value may be significantly lower in the case of contact with potentially catalytic materials  
The values of auto-ignition temperature are given without guarantee. Indeed, these values vary widely depending on the source of information.  
**Solubility :** - in water :  
soluble in all proportions  
- in organic solvents :  
Completely soluble

### 10. STABILITY AND REACTIVITY

**Stability :** The product is stable at normal storage, handling and use temperatures.  
**Conditions to avoid :** Heat (temperatures above flash point), sparks, ignition points, flames, static electricity  
**Materials to avoid :** Strong acids and strong oxidising agents  
**Hazardous decomp. products :** Acetaldehyde at temperatures around 500 - 600 °C.  
Incomplete combustion and thermolysis produces potentially toxic gases such as CO, CO2.  
Possible formation of carbon oxides, nitrogen oxides and hazardous organic compounds

### 11. TOXICOLOGICAL INFORMATION

**Acute toxicity / Local effect :**  
**Inhalation, comments:** The product is not volatile at room temperature.  
Inhalation of high concentrations of vapour or aerosols may cause irritation of the upper respiratory tract.  
High concentrations may cause headaches, dizziness, nausea, behavioural changes, weakness, drowsiness and blackouts.  
**Skin contact :** SKIN TEST LD50 (Rabbit) = 19530 mg/kg  
**Skin contact, comments:** Skin penetration is possible.  
**Eye contact, comments:** Not classified as irritating, but may cause a burning feeling and temporary reddening.  
Can cause conjunctivitis.



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Ingestion :

LD50(Rat) = 5840 mg/kg

Ingestion, comments:

Ingestion constitutes the main danger because of the toxicity of ethylene glycol  
Acute intoxication is particularly dangerous for children  
Ingestion is followed first by digestive disorders (nausea, vomiting, abdominal pain), then by loss of muscular coordination, convulsions, headaches and dizzy spells, preceding serious nervous disorders  
This develops into a state of torpor and then coma, at times accompanied by convulsions  
High metabolic acidosis (oxalic acid) leads to affliction of the renal ducts, with anuresis  
Intoxication can lead to a coma with metabolic acidosis that may be fatal  
The minimum lethal dose known for humans is 100 ml of ethylene glycol. But there are also cases known of humans who survived intoxications with more than 1 l ethylene glycol (source: BIA-Gestis data base, Germany).

CHRONIC TOXICITY OR LONG-TERM TOXICITY :

### 12. ECOLOGICAL INFORMATION

Ecotoxicity :

Acute toxicity. LC50 96 hours Rainbow Trout 18-46 g/l  
Acute toxicity. EC50 24 hours Daphnia magna 46-51 g/l  
Acute toxicity. EC50 Algae (Selenastrum capricornutum) 10 g/l

Comments about ecotoxicity :

It is considered to present a little danger for aquatic life.  
no information available for used product

Mobility :

- Air:  
there is a slow loss by evaporation.  
- Soil:  
Given its physical and chemical characteristics, the product is generally mobile in the ground  
- Water:  
Soluble in all proportions

Persistence and degradability :

The main components of the product are degradable in the environment.

### 13. DISPOSAL CONSIDERATIONS

Waste disposal :

Dispose of in a safe manner, in accordance with local regulations.  
If need be, collection by an authorised waste contractor and regeneration or incineration at an approved installation.

Waste class :

The waste classification is dependant on the composition of the product at the time of disposal.  
The waste classification mentioned here represents only a recommendation. The waste producer is responsible for the correct specification of the waste. The specification of the waste classification should be in arrangement with the authorised waste disposal company.  
Industrial waste number EU  
16 01 14

Disposal of contaminated packaging :

Proceed in compliance with the prevailing regulations.

National regulations :

- France  
List of wastes: JOCE L349 of 16.02.2001.  
Law No. 75-633 of 15.07.75 amended, relative to the elimination of wastes and the recovery of materials.  
Regulations concerning the collection of used oils:  
Decree 79-981 of 21.11.79 and rules of 28.01.99 relative to their collection and the conditions for their elimination.  
Law No. 88-1261 of 30.12.88 concerning the import, export and transit of wastes.  
Decree No. 77-254 of 08.03.77 relative to the regulation for the dumping of oils and lubricants into surface waters.





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Product name :

ANTIGEL/ANTIFREEZE

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### 14. TRANSPORT INFORMATION

Not concerned by the transport regulations below.

Road (ADR) / Rail (RID) :

Transport by barge (ADNR) :

Marine (IMO-IMDG) :

Air (ICAO/IATA) :

### 15. REGULATORY INFORMATION

Symbol(s) :



Symbol(s) :

Xn Harmful

Contains :

Monoethylene-glycol

Risk phrases :

R-22 Harmful if swallowed.

Safety phrases :

S-2 Keep out of reach of children.  
S-36/37 Wear suitable protective clothing and gloves.  
S-40 If swallowed seek medical advice immediately and show this container or label.

EU directives :

Dangerous preparations directive 1999/45/EC modified (Directive 2001/60/EC).  
D. 67/548/EC modified by D. 2001/59/EC (28th APT)

Social Security code :

- Art. L.461-6, Art. D.461-1, apendix A, No. 603  
Table of occupational illnesses and diseases No. 84

Others (French Regulations) :

Decree No. 95-326 of March, 20th 1995 (JORF of March, 25th 1995).

### 16. OTHER INFORMATION

For France, in case of poisoning call the Antipoison Centre (if possible in your area) and/or the SAMU (15), see ORFILA number below -  
Tel : Angers 02.41.48.21.21 - Bordeaux 05.56.96.40.80 - Lille 03.20.44.44.44 - Lyon 04.72.11.69.11 - Marseille 04.91.75.25.25 - Nancy 03.83.32.36.36 - Paris 01.40.05.48.48 - Rennes 02.99.59.22.22 - Strasbourg 03.88.37.37.37 - Toulouse 05.61.77.74.47  
This sheet is in compliance with the standards defined by the directives 91/155/CEE, 93/112/CEE, 2001/58/CE and the article 14 of the directive 1999/45/EC.

Explanations of R-phrases in section 2 :

R-22 Harmful if swallowed.

Revision date:

2005-05-03

Supersedes the data sheet of:

2003-06-30

\* Information revised since the previous version of the SDS :

This safety data sheet serves to complete but not to replace the technical product sheets. The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above. It is understood by the user that any use of the product for purposes other than those for which it was designed entails potential risk. The information given herein in no way dispenses the user from knowing and applying all provisions regulating his activity. The user bears sole liability for the precautions required when using the product. The regulatory texts indicated herein are intended to aid the user to fulfil his obligations. This list is not to be considered complete and exhaustive. It is the user's responsibility to ensure that he is subject to no other obligations than those mentioned.



## Safety Data Sheet

Product name :

RUBIA TIR 7400 15W40

Page: 1/6

FDS N°:30579-33

Version :1.00

Version of :2003-02-10

### PRODUCT LABELS

LABELLING (standard or EU): Not concerned  
R-phrases: None  
S-phrases: None  
TRANSPORT LABELLING: Not applicable.

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

Name of the product: RUBIA TIR 7400 15W40  
Code No.: 13T  
Product application: Motor oil  
Supplier: TOTAL LUBRIFIANTS  
Le Diamant B  
16, rue de la République  
92922 Paris La Défense - France  
Tel: +33 (0)1 41 35 40 00  
Fax: +33 (0)1 41 35 84 71  
Emergency telephones: ORFILA / Tel: 01.45.42.58.59  
See local details at end of sheet:

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

#### PREPARATION

Chemical nature: Petroleum derived severely refined mineral-base product in which the polycyclic aromatic hydrocarbons (PCA or PAH) content, measured by IP 346, is less than 3%

Substances presenting a health hazard	EC No.	CAS No.	Content	Symbol(s)	R-phrases
Zinc alkyl dithiophosphate	272-028-3	68649-42-3	<1,5 %	Xi ,N	R-38, 41, 51/53

See section 16 for explanations of R-phrases:

### 3. HAZARDS IDENTIFICATION

Health effects: Under normal conditions of use, the product holds no danger of intoxication  
Environmental impact: Do not reject this product into the environment  
Physico-chemical hazards: No specific risk of fire or explosion under normal conditions of use

### 4. FIRST AID MEASURES

IN CASE OF SERIOUS OR PERSISTENT MANIFESTATIONS, CALL A DOCTOR OR EMERGENCY MEDICAL CARE.

Inhalation: Inhalation of heavy concentrations of vapour, fumes or spray, may cause mild irritation of the throat.  
Transport the person into fresh air, keep warm and allow to rest.



## Safety Data Sheet

Product name :

RUBIA TIR 7400 15W40

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Ingestion:	Possible risk of vomiting and diarrhoea. Do not induce vomiting to avoid the risk of aspiration into the respiratory tract. Give nothing to drink
Skin contact:	Immediately remove all soiled or stained clothing. Wash the affected area immediately and repeatedly with soap and water.
Eye contact:	Keep eyes open and rinse immediately and repeatedly with water for at least 15 minutes.
Aspiration:	If the product is believed to have entered the lungs (in case of vomiting, for example), take the person to hospital for immediate care.

### 5. FIRE FIGHTING MEASURES

Flash point:  
See heading 9

Extinguishing media:

- suitable:  
Foam, carbon dioxide (CO<sub>2</sub>), powder.
- not recommended:  
do not use water jets (stick jets) for extinguishing fire since they could help to spread the flames.

Specific hazards: Incomplete combustion and thermolysis produce gases of varying toxicity such as CO, CO<sub>2</sub>, various hydrocarbons, aldehydes and soot. These may be highly dangerous if inhaled.

Protective measures for firefighters: Insulated breathing apparatus must be worn in confined premises with heavy concentrations of fumes and gases.

### 6. ACCIDENTAL RELEASE MEASURES

See sections 8 and 13.

After spillage / leakage:

- On the soil:  
Surfaces on which the product has been spilled may become slippery.  
Do not allow the product to enter sewers or rivers or contaminate the soil.  
Recover with mechanical means such as pumps and skimmers.
- On water:  
Flooding absorbant material, then mechanical recovery.  
If the product is spilled in a river or in the sewers, notify the authorities of the possible presence of floating items.

### 7. HANDLING AND STORAGE

HANDLING:

Prevention of user exposure: Ventilate extensively if the formation of vapours, fumes, mists or aerosol is a risk.  
Make all the necessary arrangements in order to reduce exposure risk, notably to products in use or to wastes.  
Keep away from combustive substances; keep away from food and beverages.

Prevention of fire and explosion: Empty containers may contain flammable or explosive vapours.  
There is a fire hazard associated with rags, paper or any other material used to remove spills which become soaked with product.  
Avoid accumulate of these: they are to be disposed off safely after use.

Precautions: Avoid static electricity build up with connection to earth.  
Set up machinery and equipment so as to avoid the risk of accidental spills or splashes onto hot machine parts and electrical contacts (on joint failure, for example).

STORAGE:

Technical measures: Make the necessary arrangements to prevent water and soil pollution.



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Storage precautions:

. Suitable:  
Store at room temperature, protected against contact with water and moisture, and away from any source of ignition.  
Keep containers closed when not in use  
. To be avoided:  
Do not store exposed to the elements.

Incompatible products:

Dangerous reaction with strong oxidizing agents.

Packaging materials:

. Recommended:  
Use only hydrocarbon-resistant containers, joints, pipes, etc.  
Keep in original container if possible.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Technical measures:

Use the product in a properly ventilated atmosphere.  
When working on enclosed place (tanks, reservoirs...), make sure that atmosphere is not suffocating and/or wear recommend equipment.

Occupational exposure limit:

. oil mist : 10mg/m3, for 15 minutes  
. oil mist : 5mg/m3, for 8 hours

Hand protection:

Impermeable hydrocarbon-proof gloves,  
recommended material: nitrile , neoprene.

Eye protection:

Goggles, in case of risk of splashing.

Skin and body (other than the hands) protection:

As required, wear a face mask, hydrocarbon-proof clothing, and safety boots (when handling drums).  
Don't wear ring, watch or similar thing which will be able to hold the product and may give rise to some skin diseases.

Hygienic work practices:

Avoid prolonged and repeated contact with the skin, especially with used or waste product  
Immediately remove all soiled or stained clothing.  
If the product comes into contact with the skin, wash the affected area immediately and copiously with soap and water.  
Use no abrasives, solvents or fuels.  
Do not use cloths stained with the product to dry hands.  
Do not put the product-soaked rags in the pockets of working clothes.  
Do not eat, drink or smoke while handling the product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Liquid.

Colour:

Brown.

Odour:

Characteristic.

Density/specific gravity:

885 Kg/m3  
Temperature (°C) 15

Flash point:

> 220 ° C (ASTM D 93)

Température d'auto-inflammation:

>250°C (ASTM E 659)

Comments on autoignition temperature:

This temperature may be significantly lower under particular conditions (slow oxidation on finely divided materials...).  
Pour point: < -24 °C (ASTM D 97)

Partition coefficient (log Pow):

Log Pow > 6  
Temperature (°C) (20°C)



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Viscosity: 14.2 mm<sup>2</sup>/s  
Temperature (°C) 100

### 10. STABILITY AND REACTIVITY

Stability: The product is stable at normal storage, handling and use temperatures.

Conditions to avoid: Heat (temperatures above flash point), sparks, ignition points, flames, static electricity

Materials to avoid: Avoid contact with strong oxidizing

Hazardous decomp. products: Incomplete combustion and thermolysis produce more or less toxic gases such as CO, CO<sub>2</sub>, various hydrocarbons, aldehydes and soot.

### 11. TOXICOLOGICAL INFORMATION

Acute toxicity / Local effect:

Inhalation, comments: - Inhalation :  
Risk is improbable under normal conditions of use  
Inhalation of important concentration of vapour or aerosols may cause irritation of the upper respiratory tract.

Skin contact, comments: - Contact with skin :  
Risk is improbable under normal conditions of use.

Ingestion, comments: - Ingestion :  
In case of ingestion of small quantities, no important effect observed. in case of ingestion of larger amounts: abdominal pain, diarrhea, ...

CHRONIC TOXICITY OR LONG-TERM TOXICITY:

Skin contact: Characteristic skin affections (oil blisters) may develop following prolonged and repeated exposure through contact with stained clothing

Sensitization: To our knowledge, the product does not cause aggravated sensitivity.

Carcinogenicity: During use in engines, contamination of oil with low levels of combustion products occurs. Used motor oils have been shown to cause skin cancer in mice following repeated application and continuous exposure.  
Brief or intermittent skin contact with used motor oil is not expected to have serious effects in humans if the oil is thoroughly removed by washing with soap and water.

### 12. ECOLOGICAL INFORMATION

Comments about ecotoxicity: Experimental data on the finished product are not available.  
no information available for used product  
It is considered to present a little danger for aquatic life.

Mobility: - Air:  
there is a slow loss by evaporation.  
Given its physical and chemical characteristics, the product generally shows little mobility in the ground.  
- Water:  
The product is insoluble; it spreads on the surface of the water  
- Ground:

### 13. DISPOSAL CONSIDERATIONS



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Waste disposal:	Dispose of in a safe manner, in accordance with local regulations. If need be, collection by an authorized waste contractor and regeneration or incineration in an approved installation
Waste class:	13-02-02 (non-chlorinated engine, gear, lubricating oils)
Disposal of contaminated packaging:	Proceed in compliance with the prevailing regulations.
National regulations:	* France Notice of 11.11.1997 concerning the nomenclature for waste. See wastes nomenclature (JOCE : L 349 from the 31/12/2001). Law No. 75-633 of 15.07.75 amended, relative to the elimination of wastes and the recovery of materials. Regulations concerning the collection of used oils: Decree 79-981 of 21.11.79 and rules of 28.01.99 relative to their collection and the conditions for their elimination. Law No. 88-1261 of 30.12.88 concerning the import, export and transit of wastes. Decree No. 77-254 of 08.03.77 relative to the regulation for the dumping of oils and lubricants into surface waters.

### 14. TRANSPORT INFORMATION

Not concerned by the regulatory below.

Road (ADR) / Rail (RID):

Class:

Not restricted for transport.

Transport by barge (ADNR):

Marine (IMO-IMDG):

Air (ICAO/IATA):

### 15. REGULATORY INFORMATION

None

Risk phrases:

None

Safety phrases:

None

EU directives:

Hazardous preparations directive 1999/45/EC modified (Directive 2001/60/EC).

Occupational Safety code:

- Art. L 461-6, Art. D 461-1, appendix A, No. 601.  
Table of occupational illnesses and diseases No. 36

Labor code:

- Art. R 241-50, decree of 07.11.1977.

### 16. OTHER INFORMATION

This sheet is in compliance with the standards defined by the directives 91/155/CEE, 93/112/CEE, 2001/58/CE and the article 14 of the directive 1999/45/EC.

For France, in case of poisoning call the Antipoison Centre (if possible in your area) and/or the SAMU (15), see ORFILA number below - Tel : Angers 02.41.48.21.21 - Bordeaux 05.56.96.40.80 - Lille 03.20.44.44.44 - Lyon 04.72.11.69.11 - Marseille 04.91.75.25.25 - Nancy 03.83.32.36.36 - Paris 01.40.05.48.48 - Rennes 02.99.59.22.22 - Strasbourg 03.88.37.37.37 - Toulouse 05.61.77.74.47

Explanations of R-phrases in section 2:

R-38 Irritating to skin.  
R-41 Risk of serious damage to eye.  
R-51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Revision date:

2003-02-10



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\* Information revised since the previous version of the SDS:

SDS No.:

p181-0000627-45

This safety data sheet serves to complete but not to replace the technical product sheets. The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above. It is understood by the user that any use of the product for purposes other than those for which it was designed entails potential risk. The information given herein in no way dispenses the user from knowing and applying all provisions regulating his activity. The user bears sole liability for the precautions required when using the product. The regulatory texts indicated herein are intended to aid the user to fulfil his obligations. This list is not to be considered complete and exhaustive. It is the user's responsibility to ensure that he is subject to no other obligations than those mentioned.

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## G.2 Energy Efficiency

Oxigen uses machine gas oil, electricity and water in the operation of the facility. It is a dry process and therefore large amounts are not currently used. Gasoil and electricity are the two forms of energy used on-site. This energy is used to power machinery in the processing of waste and to illuminate the working area. Electricity is also used in the day to day staff activity fro example lighting in common areas, water heating in canteen.

Oxigen Environmental Ltd. availed of the Sustainable Energy Ireland's (SEI) Advice, Mentoring & Assessment Programme from SMEs in July 2009 to get an objective insight and overview of the Facility's energy consumption and energy efficiency. This report follows a similar format to that outlined in the EPA Guidance Note on Energy Efficiency Auditing. A copy of this report is included as part of the EIS for this application.

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## Advice, Mentoring & Assessment Programme

Site Visit Report for

Oxygen Environmental Ltd.,

Merrywell Ind. Est.,

Ballymount Road

Dublin 12

Prepared by Pat Duke

Integrated Engineering Consultancy Ltd

7<sup>th</sup> July 09

SEI Client ID: 1559

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## Executive Summary

For Oxygen to reduce their energy cost they need to set up an Energy Management Programme which has full support from senior management. Training in energy management, the setting up of an energy team and monitoring weekly energy usage against waste material will be essential for the programme to be effective.

The site visit identified the potential to reduce the overall site energy costs by Euro 29,932 which represents an 11.4 % reduction in the total energy cost. This saving does not include the potential MIC saving of Euro 10,000 or the saving by supplying the 2 off 132 kW motors from the main electricity supply. The mains electrical load profiles indicate a high base load during non working times which needs to be investigated.

Oxygen has an annual energy spend of Euro 262,017. This can be broken down as shown in Table 1A below;

**Table 1A Annual Energy Consumption & Cost 2008/09**

Fuel	Use kWh	%	Cost	%	Unit Cost c/kWh	Delivery Cost c/kWh	Tonne CO2
Elect.	1,035,174	57.0	159,639	60.93	15.42	15.42	659.4
Nat Gas	190,487	10.5	8,955	3.42	4.70	6.72	37.7
Gas Oil	591,360	32.5	93,422	35.65	15.80	15.80	156.1
<b>Total</b>	<b>1,817,021</b>	<b>100</b>	<b>262,017</b>	<b>100</b>			<b>853</b>

Electricity is mainly used for Waste recycling and lighting. A breakdown of the main electrical energy users is outlined below in table 1B;

**Table 1B Breakdown of Electrical Energy use & Cost**

Plant Item	Use kWh	Cost Euro	% Total
Waste C&I Plant	190,488	29,376	18
Waste Dry Recycling Plant	434,606	67,023	42
Lighting	370,601	57,152	36
Other	39,500	6,091	4
<b>Total</b>	<b>1,035,195</b>	<b>159,643</b>	<b>100</b>

**Table 1C Breakdown of Thermal Energy Use & Cost**

Thermal energy is mainly used for office space heating and driving the generator for the 132 kW motors. A breakdown of the thermal energy users is outlined below in table 1C

Fuel	Use kWh	Cost	% Total
Office heating	190,487	8,955	8.7
Generator (2 off 132 kW motors)	591,360	93,422	91.3
Total	781,847	102,377	100

Savings identified during the survey are outlined in table 1 D.

**Table 1D Savings Identified during Site Visit**

Ref	Opportunity	Indicative Benefits Euro (kWh)	Cost Range	Category	Target Date
01	John Doyle should attend and SEI Energy map training programme	Improved Energy management skills	No / Low	Organisational	6 Months
02	Set up an energy monitoring system to measure weekly electricity usage versus weekly material recycled	Provide an Energy Performance Indicator of weekly energy usage	No / Low	Organisational	3 Months
03	Review MIC capacity together with switching both 132 kW motors onto site electricity supply	12, 000 (0 kWh)	Medium	Technical	3 Months
04	Draw up an operation schedule for each motor on the Waste Dry Re-cycling Plant to identify motors which can be switched off during break/lunch times	2,687 (7,384)	No / Low	People	3 Months
05	Draw up an operation schedule for each motor on the Waste C&I Plant to identify motors which can be switched off during break/lunch times	1,175 (7,620)	No / Low	People	3 Months
06	Replace the 60 off 400 watt fitting with 250 watt fitting plus occupancy sensor in C& D shed	8,193 (53,130)	Medium	Technical	12 Months
07	Replace the 108 off 400 watt fitting with 250 watt fittings plus occupancy sensor in Paper shed	14,748 (95,634)	Medium	Technical	12 Months
08	Replace the 17 off 400 watt fitting with 250 watt fittings plus occupancy sensor in Garage	2,312 (15,054)	Medium	Technical	3 Months
09	Insulate boiler	1,791 (38,097)	Medium	Technical	3 Months
10	Install weather compensating control to boiler	2,343 (28,573)	Medium	Technical	3 Months

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## 1 Introduction

### 1.1 Site Visit

Organisation Name: Oxigen Environmental Ltd

Site Name & Address: Merrywell Ind. Est., Ballymount Road, Dublin 12:

SEI Client ID: 1559

Date of Visit: 7<sup>th</sup> July 2009

Duration of Visit (h): 3.5 hr

SEI Energy Advisor: Pat Duke, Integrated Engineering Consultancy Ltd.,  
086 818 25 36 patduke@iol.ie

Visit Hosted By: John Doyle Project Manager

Pat Duke, Integrated Engineering Consultancy Ltd., undertook a site visit of the Oxigen Environmental Ltd. site at Merrywell Ind. Estate, Ballymount Road, Dublin 12 under SEI's Advice, Mentoring & Assessments Programme for SMEs.

The site visit was hosted by John Doyle Project Manager. Initially the discussion focused on the current energy management system and a review of both electricity and natural gas usage. This was followed by a tour of the site.

This report has been prepared with all reasonable skill, care and diligence and summarises the findings from the half-day site visit. All values quoted in this Report are based on information provided by the Client. All values quoted for energy savings are estimates and may require additional detailed investigation to confirm their validity.

### 1.2 Description of Site

Oxigen Environmental is a waste management recycling company. They recycle approximately 80,000 tonne of Construction & Demolition material annually, usually from skips and approximately 40,000 tonne of dry commercial waste. The plant operates on a 2 shift five day cycle from 6 am to 10 pm. There is approximately 80 staff (20 Office and 60 Processing). The plant consists of two large sheds approximately 12,000 m<sup>2</sup>

### 1.3 Client's Objectives

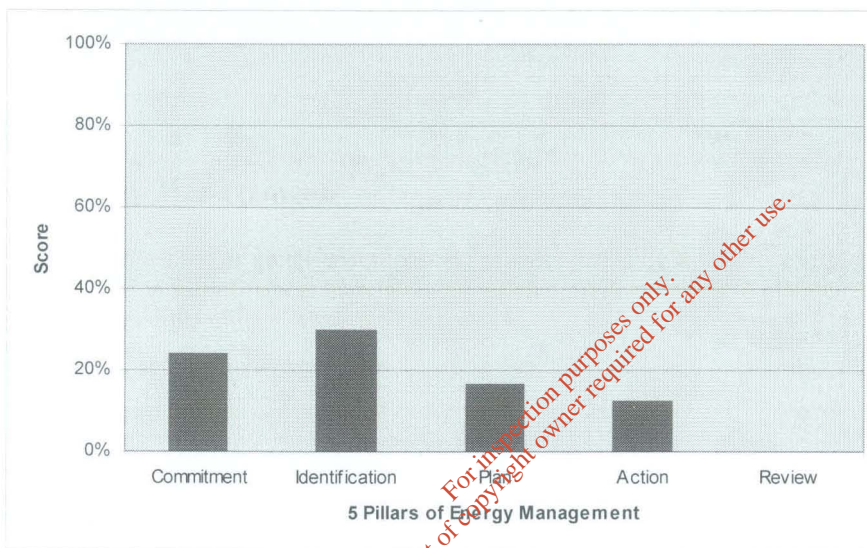
Oxigen aim is to set up an energy management system to control cost not only on this site but also on their six locations in Ireland.

## 2 Energy Management

Energy management is an all-encompassing process that should include every aspect of an organisation from finance, human resources and public relations to maintenance, purchasing and planning.

An Energy Management Diagnostic Questionnaire was completed for the site; the completed questionnaire is included in Appendix A. Oxigen scored 17% overall on this diagnostic. Figure 1 shows the breakdown of the score between the five pillars of energy management.

**Figure 1: Breakdown of Energy Management Diagnostic Score**



The results show that Oxigen needs to increase their activity in all five areas of the Energy Management Pillars if they are to achieve their aim of setting up an effective energy management programme.

The principal barriers to developing, implementing and maintaining a full and effective energy management system at the site are;

- Capital investment which is highly dependent on payback period
- The availability of management/employees resource to operate an energy management programme.
- The need for training of staff in energy management practices.

SEI providing training through their Energy map programme. See option No.1 in table 4.

There is additional information available on energy management from SEI's Energy MAP website at [www.sei.ie/energymap](http://www.sei.ie/energymap).

### 3 Energy Consumption

#### 3.1 Annual Consumption

Oxygen Environmental Ltd's have an annual energy cost and consumption of Euro 262,017 and 1,817,021 kWh respectively. Electricity accounts for 61% of the total cost (This does not including the diesel cost to operate the two 132 kW motors). The average unit cost of electricity from the grid is 15.42 c/kWh compared to average unit costs from natural gas of 6.72 c/kWh (based on a boiler thermal efficiency of 70%) and diesel of 15.8 c/kWh (based on an estimated generator efficiency of 30% and an estimated fuel cost of 50 cent/litre for gas oil).

The annual energy consumption is based on the following invoices;

Electricity: June 2008 to May 2009

Natural Gas: 31<sup>st</sup> January 2009 to 7<sup>th</sup> May 2009 (extrapolated for full year)

Gas Oil: Base on operating 2 off 132 kW motors using a diesel generator.

The electricity invoices shows a MIC excess penalty charge of Euro 17,153. The site excess MIC has recently increased from 135 kVA to 250 kVA. To reduce this excess penalty the site MIC will need to be increased by at least 250 kVA. This will save approximately Euro 10,000 per annum.

The cost of operating the generator is based on a fuel cost of 50 cent/litre and a diesel generator efficiency of 30%. This equates to a average unit energy cost of 15.8 c/kWh for providing electricity to the two 132 kW motors from the generator, which is slightly higher than the average unit cost of the sites electricity cost of 15.4 c/kWh. If both motors were supplied from the sites electricity supply there would be a saving of Euro 2,225, but this would require cabling to be installed and an increase in the MIC. If the cost of diesel was to increase to 55 cent/litre and the actual diesel generator efficiency was found to be only 25% then the saving would increase dramatically to Euro 32,120. This needs further investigation and should be considered together with any proposed increase of the sites MIC. See option No 3 in table 4.

Details of Oxygen Environmental Ltd's annual energy consumption is set out in Table 1 and summarised in Figures 2, 3 and 4.

Figure 2: 2008/09 Breakdown of Energy Consumption (kWh)

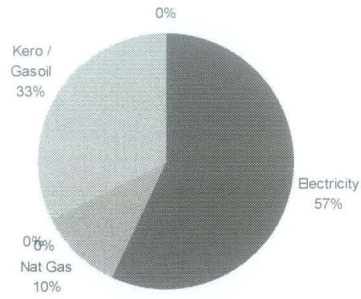


Figure 3: 2008/09 Breakdown of Energy Spend (net VAT)

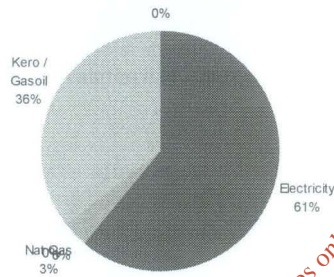
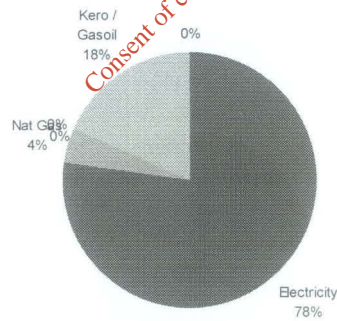


Figure 4: 2008/09 Breakdown of Energy Related CO<sub>2</sub> Emissions



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**Table 1: Annual Energy Consumption & Energy Costs**

Fuel	Use kWh	%	Cost	%	Unit Cost c/kWh	Delivery Cost c/kWh	Tonne CO2
Elect.	1,035,174	57.0	159,639	60.93	15.42	15.42	659.4
Nat Gas	190,487	10.5	8,955	3.42	4.70	6.72	37.7
Gas Oil	591,360	32.5	93,422	35.65	4.74	15.80	156.1
<b>Total</b>	<b>1,817,021</b>	<b>100</b>	<b>262,017</b>	<b>100</b>			<b>853</b>

### 3.2 Main Energy Consumers

The main energy consumers at the site are summarised in Tables 2 & 3 below. Motive power for the waste sorting/recycling and lighting is the main electrical energy consumers.

**Table 2: Summary of Primary Electrical Energy Consumers**

Electrical Energy Consumer	% of Total	Comments
Waste Dry Recycling Plant	42	Based on motor schedule
Lighting	36	Based on survey
Waste C&I Plant	18	Based on motor schedule
Other	4	Estimated
<b>Total</b>	<b>100</b>	

Thermal energy is mainly used for space heating in the offices and driving the generator for the 132 kW motors. A breakdown of the thermal energy users is outlined below in table 3.

**Table 3: Summary of Primary Thermal Energy Consumers**

Thermal Energy Consumer	% of Total	Comments
Office Space Heating	9	Base on estimated natural gas usage
Generator for 2 no. 132 kW motors	91	Base on estimated diesel coast and generator efficiency
<b>Total</b>	<b>100</b>	

### 3.3 Energy Performance Indicators (EPIs)

No energy performance indicators are in use at present. Details are available on the tonnage of material recycled each week and this information could easily be combined with data on electricity usage to give an effective indicator i.e. kWh/tonne of recycle material. To do this the electricity meter should be read every Monday morning at the same time before the start of processing. A weekly index of kWh/Tonne will be established and if trended over time to help identify changes in demand and also any reductions in energy use due to energy conservation actions taken. See option 2 in table 4.

Thermal energy (natural gas) is used only for office heating. This could be trended against degree days but as discussed during the site visit this is more complex and has no relationship with the electricity usage.

## 4 Opportunities for Energy Savings

### 4.1 Recent/Existing Energy Saving Initiatives

The design of both the Waste Dry Recycle Plant and Waste C&I Plant incorporates numerous inverters (variable speed drives) on motive power applications. The potential to improve the efficiency of these sorting processes was discussed with John Clune (Operations Manager) who was involved in the installation and commissioning of the plant. Other than ensuring the plant is operated at its full capacity and that the equipment is not left operating unnecessarily the potential to reduce cost on the Waste Dry Recycle Plant and C&I Plant is limited.

Oxigen are currently reviewing their fuel fleet usage in the view of undertaking some training in driver awareness, as well as investigating the possibility of changing to bio-fuels.

### 4.2 Suggested Opportunities for Energy Savings

We identified a number of opportunities for further energy savings at the site; these are summarised in Table 4 overleaf. All values quoted for energy savings are estimates and would require further investigation to verify their accuracy. The main areas for energy cost savings are as follows:

1. There is potential to reduce costs in both the Waste Dry Recycle Plant and C&I Plants by ensuring that equipment is switched off when not required. Oxigen have a detail schedule of all motors and its recommended that this list be used to identify those motors that can be switched off at break and lunch times. See opportunity No. 4 & 5 in Table 4.
2. Lighting accounts for approximately 36% of the total electricity cost. There is potential to reduce lighting costs by replacing the 400 watt mercury fluorescent fittings with

more efficient lamps. These light fittings are very inefficient and could easily be replaced with energy efficient fittings which will reduce energy consumption by up to 50% without affecting light output. A new lighting scheme could also incorporate occupancy sensors which would switch lights off when not needed. This is an ideal option for the sheds and garage. See table 4 for opportunities No. 6, 7 & 8.

3. The boiler is over 30 year old and it is recommended that a combustion efficiency test be undertaken to check its efficiency. Given its age the physical condition of the boiler should be checked as it has exceeded its normal life expectancy. It was noted that the boiler is not insulated and this will result in a dramatic reduction in its overall thermal efficiency. There is a strong probability that the results of these tests will indicate a need to replace the boiler. Modern boilers are designed to give greater efficiency, and this option should be seriously considered. Consideration should also be given to installing weather compensator controls which will minimise boiler use by taking the external ambient temperature into account. The savings associated with both these actions is outlined under opportunities 9 & 10 in table 4.

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**Table 4: Opportunities for Energy Savings**

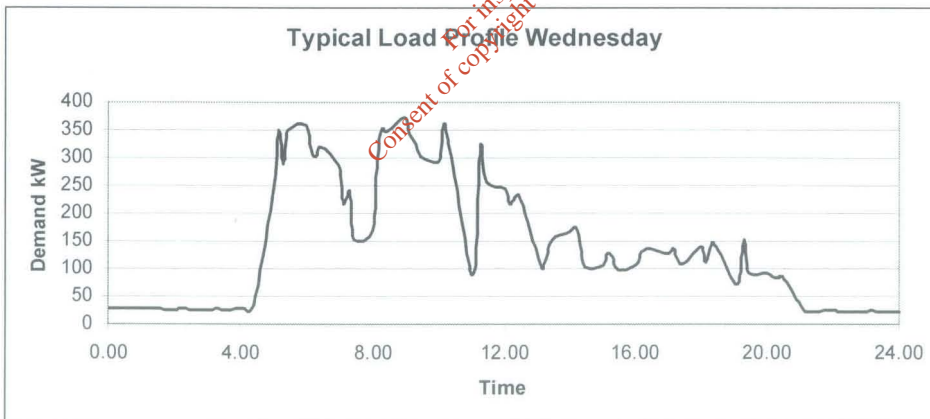
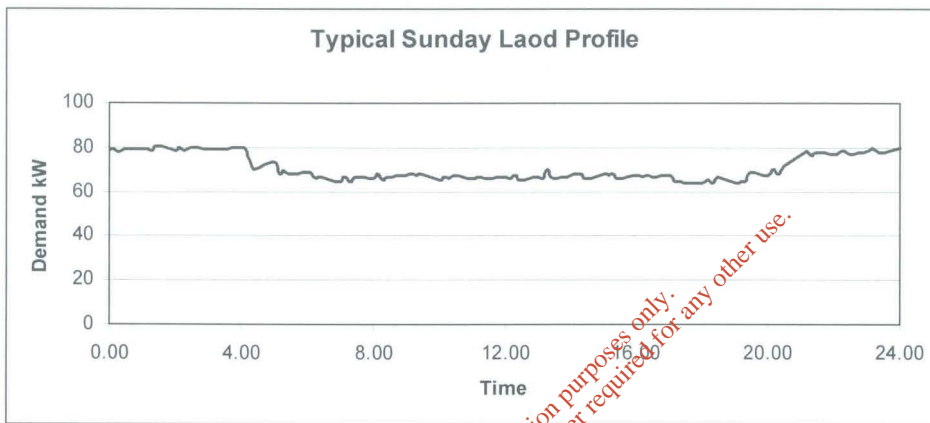
Ref	Opportunity	Indicative Benefits Euro (kWh)	Cost Range	Category	Target Date
01	John Doyle should attend and SEI Energy map training programme	Improved Energy management skills	No / Low	Organisational	6 Months
02	Set up an energy monitoring system to measure weekly electricity usage versus weekly material recycled	Provide EPI of weekly energy usage	No / Low	Organisational	3 Months
03	Review MIC capacity together with switching both 132 kW motors onto site electricity supply	12, 000 (0 kWh)	Medium	Technical	3 Months
04	Draw up an operation schedule for each motor on the Waste Dry Recycling Plant to identify motors which can be switched off during break/lunch times	2,681 (17,384)	No / Low	People	3 Months
05	Draw up an operation schedule for each motor on the Waste C&I Plant to identify motors which can be switched off during break/lunch times	1,175 (7,620)	No / Low	People	3 Months
06	Replace the 60 no. 400 watt fitting with 250 watt plus occupancy sensor in C& D shed	8,193 (53,130)	Medium	Technical	12 Months
07	Replace the 108 no. 400 watt fitting with 250 watt plus occupancy sensor in Paper shed	14,748 (95,634)	Medium	Technical	12 Months
08	Replace the 17 no. 400 watt fitting with 250 watt plus occupancy sensor in Garage	2,312 (15,074)	Medium	Technical	3 Months
09	Insulate boiler	1,791 (9,097)	Medium	Technical	3 Months
10	Install weather compensating control to boiler	3,943 (28,573)	Medium	Technical	3 Months

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## 5 Additional Information

Oxygen has access to the Airtricity web site and can view their electricity invoices and energy consumption usage and profile. Outlined below are two example of the type of information available. These show a typical load profile for a Sunday (non-working day) and Wednesday.

The Sunday profile shows a base load of approximately 60 kW. This is high for a plant not in use. The security lighting can be seen to operate between 04.00 to 20.00 hours with a load of approximately 15 kW. The high base load needs to be investigated and indicates a potential saving of Euro 20,000 if it can be reduced.



## 6 Next Steps

- John Doyle should review this report and in particular the opportunities for energy savings identified in Table 4.
- Pat Duke will contact John Doyle in about one week to briefly discuss this report and to provide any relevant clarifications.
- SEI has appointed Pat Duke to provide follow-up energy management mentoring to Oxigen over the **next three months**. Pat Duke will contact John Doyle regularly over this period to assist, mentor and encourage Oxigen to implement the opportunities for energy savings identified in Table 4 and in improving energy management.
- Oxigen should use this three month period to kick-start progress on the energy savings opportunities and to improve on the priority areas identified in the Energy Management Diagnostic Questionnaire.
- John Doyle should contact Pat Duke by email or by telephone over this period with any queries relevant to energy management.
- Ms. Mairead Cirillo of SEI will contact John Doyle over the next few weeks with a request to fill out a short evaluation of SEI's Advice, Mentoring & Assessments Programme for SMEs; we would be grateful for co-operation in completing this.
- Additional information on the Acceleration Capital Allowance (ACA) programme (ref Opportunity No.6,7 & 8 in Table 4).is available from [www.sei.ie/aca](http://www.sei.ie/aca)
- Ms. Mairead Cirillo of SEI will be in contact shortly to discuss training opportunities provided by SEI that would be of benefit to John Doyle (ref Opportunity 1 in Table 4)

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### Appendix A – Site Tour Checklist

Item	Score						Observations / Comments
	Poor			Excellent			
	1	2	3	4	5	N/A	
Physical Condition of Buildings / Plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Insulation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No insulation on boiler
Steam / Condensate / Hot Water Leaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Boiler House	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No insulation on boiler
Compressed Air	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooling Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Production Plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lighting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Good potential to reduce lighting costs.
Evidence of Energy Awareness (posters etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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### Appendix B- Energy Management Diagnostic Questionnaire

Appendix B - Energy Management Diagnostic Questionnaire						
Site Name: <input type="text" value="Ougen Environmental Ltd"/>		SEI Client ID: <input type="text" value="1559"/>				
Participants: <input type="text" value="John Doyle"/>		Score: <input type="text" value="17%"/>				
SEI Energy Advisor: <input type="text" value="Pat Duke, Integrated Engineering"/>		Date: <input type="text" value="7th July-09"/>				
Question	Assessment				Additional Comments	
Commitment	1 Is there Senior Management commitment (to Energy Management)?	<input type="radio"/> No interest	<input type="radio"/> Interest but no commitment	<input checked="" type="radio"/> Some commitment, but could do better	<input type="radio"/> Full commitment	If costs savings can be shown
	2 Is there a Senior Manager appointed to sponsor Energy Management?	<input type="radio"/> No	<input checked="" type="radio"/> Informal appointment	<input type="radio"/> Formal appointment but low priority	<input type="radio"/> Formal appointment	Reports to senior management
	3 Is there a Co-ordinator appointed to manage Energy Management?	<input checked="" type="radio"/> No	<input type="radio"/> Informal appointment	<input type="radio"/> Formal appointment but low priority	<input type="radio"/> Formal appointment	
	4 Is there an Energy Management Team?	<input checked="" type="radio"/> No	<input type="radio"/> Informal team	<input type="radio"/> Formal team - does not meet regularly/ function well	<input type="radio"/> Formal team - meets regularly & functions well	
	5 Is there an Energy Policy?	<input type="radio"/> No Policy	<input type="radio"/> Informal Policy	<input checked="" type="radio"/> Incomplete Policy	<input type="radio"/> Complete, formal, well-communicated policy	Environmental policy with requirement
Identification	6 Have you undertaken an overview of past & present energy consumption?	<input type="radio"/> Not at all	<input type="radio"/> Informally (no quantification)	<input type="radio"/> Informally (some quantification)	<input checked="" type="radio"/> Yes, formally (quantified assessment)	
	7 Have you surveyed current energy use & identified significant energy users?	<input type="radio"/> Not at all	<input checked="" type="radio"/> Informally (no quantification)	<input type="radio"/> Informally (some quantification)	<input checked="" type="radio"/> Yes, formally (quantified assessment)	
	8 Have you identified the key factors that influence energy consumption & Energy Performance Indicators?	<input checked="" type="radio"/> Not at all	<input type="radio"/> Informally (no quantification)	<input type="radio"/> Informally (some quantification)	<input type="radio"/> Yes, formally (quantified assessment)	
Plan	9 Do you continuously identify energy-saving opportunities?	<input checked="" type="radio"/> Rarely / never	<input type="radio"/> Informally & infrequently	<input type="radio"/> Informally but regularly	<input type="radio"/> Formally & regularly	
	10 Do you set (Energy) Objectives & Targets?	<input checked="" type="radio"/> No	<input type="radio"/> Informally, but performance is not tracked	<input type="radio"/> Informally & performance is tracked	<input type="radio"/> Formally & performance is tracked	
	11 Do you have an Energy Savings Programme Plan?	<input checked="" type="radio"/> No	<input type="radio"/> Informal, unwritten Programme Plan	<input type="radio"/> Informal, written Programme Plan	<input type="radio"/> Formal Programme Plan	
	12 Are adequate resources formally allocated to Energy Management / energy saving activities?	<input type="radio"/> None allocated	<input type="radio"/> Insufficient (informal allocation)	<input checked="" type="radio"/> Insufficient (formal allocation)	<input type="radio"/> Full & sufficient resources allocated	
Action	13 Do you implement your Energy Savings Programme Plan (see Q.11)?	<input type="radio"/> N/a (no Programme Plan)	<input checked="" type="radio"/> No implementation	<input type="radio"/> Partial implementation	<input type="radio"/> Full implementation	
	14 Are energy-efficient practices and energy awareness promoted amongst employees?	<input checked="" type="radio"/> Not at all	<input type="radio"/> Informally & infrequently	<input type="radio"/> Informally but regularly	<input type="radio"/> Formal, ongoing Programme	
	15 Are key personnel trained in energy efficient practices?	<input checked="" type="radio"/> Not at all	<input type="radio"/> Informally	<input checked="" type="radio"/> Yes, but not all relevant personnel	<input type="radio"/> Yes (all relevant personnel)	
	16 Are significant energy users designed, operated & maintained to optimise energy efficiency?	<input type="radio"/> Not at all	<input type="radio"/> Efficiency considered, but not high priority	<input checked="" type="radio"/> Efficiency only by design	<input type="radio"/> Yes (formal procedures in place)	
Review	17 Do you measure & monitor energy performance & check against targets?	<input checked="" type="radio"/> No (never)	<input type="radio"/> Ad hoc measurement & monitoring only	<input type="radio"/> Yes, but don't check against targets	<input type="radio"/> Yes (continuously)	
	18 Do you identify & implement corrective actions?	<input checked="" type="radio"/> No (never)	<input type="radio"/> Ad hoc	<input type="radio"/> Yes, but not as a continuous, ongoing process	<input type="radio"/> Yes (continuous improvement)	
	19 Do you periodically review your Energy Management System & identify improvements?	<input checked="" type="radio"/> No (never)	<input type="radio"/> "If it ain't broke I don't fix it"	<input type="radio"/> Informally only	<input type="radio"/> Yes (always looking to improve)	
	20 Is there periodic management review of Energy Management?	<input checked="" type="radio"/> No (never)	<input type="radio"/> Superficial review only	<input type="radio"/> Incomplete review	<input type="radio"/> Formal review	
Barriers	What do you consider to be the 3 most important barriers to developing, implementing and maintaining a full and effective Energy Management System within your organisation? [e.g. resources, training budgets, capital budgets, management time, lack of competent personnel etc.]					
	i Capital investment will depend on payback.					
	ii Management /employee resources to operate an energy management programme.					
iii Training in energy management.						

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