Mrs. Linda Bluestein
U.S. Department of Energy, EE-34
1000 Independence Ave., SW
Washington, DC 20585

Dear Mrs. Bluestein,

Please find our response to the questionnaire submitted to Mossgas on the 23 of August 2001.

Query 1

Energy Efficiency.

The petition should refer to energy efficiency and not a mass efficiency. We present this in Table 1 for the 3 RFD formulations in the petition.

Table 1

Energy and Carbon Efficiency			
Item	RFD1	RFD2	RFD3
Energy Efficiency- %	63.7	64.0	63.7
Carbon Efficiency- %	80.2	80.2	80.2
Nm3 CO2/kg product	0.39	0.39	0.39

Query 2

Carbon Efficiency.

We have presented the carbon efficiency in the Table 1. Some of the rejected carbon is vented as CO_2 in the process of conditioning the syngas from our CO_2 removal unit, while the balance is vented as flue gas as a product of the factory fuel gas systems. Of the former, Mossgas recovers and sells approximately 8% of the vented stream of 28 tons per hour CO_2. The sale of

CO_2 will be location specific depending on the volume that markets can absorb.

Query 3 & 4

Product Slate.

Table 2

Mossgas Feeds and Products			
Products	Component	Volume	Energy
		m3/h	Million Btu/h
LPG Blending Components	Propylene	0.0	0
	Propane	5.5	120.7
	Butylene	3.7	87.5
	Butane	1.8	42.7
M97 Petrol Blend Components	Alkylate	25.4	728.4
	COD Petrol	17.4	502.1
	Penexate	16	423.9
	Platformate	42.3	1366.3
Distillate	Synthetic Distillates*	76.8	2509.8
	S/R diesel	2.5	79.1
Other	Light alcohol	10.7	225.2
	Mosstanol 120	5.6	138.5
	Fuel Oil	5.3	190.8
* COD and Synthol Distillates			
** A further 2.15 t/h CO2 is recovered from the CO2 Removal plant and sold as liquid.			
Feeds	Component	Volume	Energy
		m3/h	Million Btu/h
Landed Gas		218598	8129.5
Condensate		58	1593.5
Electricity	(89.7 MW)		306.1
Gas flow in Nm3/h and liquids in standard m3/h			

Table 3

Product	Density	Carbon	Sulphur	Heating Values	Heating Values
	ASTM D4052	GC/MS	ASTM D2622	Higher	Lower
	Kg/l	% m/m	% m/m	Btu/gal	Btu/gal
Diesel RFD 1	0.809	85.63	<0.001	135232.6	125090.2
Diesel RFD 2	0.807	85.63	<0.001	138286.3	127914.8
Diesel RFD 3	0.807	84.49	<0.001	134214.8	124148.7
Gasoline	0.722	85.71	<0.001		112548.7
Kerosene	0.766	85.63	<0.001		
Light Alcohol	0.788	55.15	<0.001		80010.9
Mosstanol 120	0.805	62.88	<0.001		93866.8
Fuel Oil	0.926	85.63	<0.001		135521.9

Note: Full specifications are given for the RFD fuels in Tables 2 and 3 in our original submission.

Query 5

FT Plant Input Requirements.

a) Natural gas: 218598 m^3/hr

b) Natural gas liquids: 58 m^3/hr

c) Electricity: 89.7 MW

d) Water use: 648 m^3/hr

e) Oxygen: 120410 Nm^3/hr

This for the May 26, 1999 to June 26, 1999 basis actual operating figures.

Query 6

Table 4

Mossgas Feed Input and Product Outputs per Million Energy Units of RFD Fuel				
		Relative BTU's		
Product	Component	RFD1	RFD2	RFD3
Distillate	RFD Synthetic Distillate	1000000	1000000	1000000
	Distillates	1255114	0	1314756
	S/R diesel	0	31498	0
LPG Blending Components	Propylene	0	0	0
	Propane	106400	48111	107070
	Butylene	77071	34849	77555
	Butane	37627	17014	37864
M97 Petrol Blend Components	Alkylate	641867	290231	645904
	COD Petrol	442416	200046	445200
	Penexate	373516	168892	375865
	Platformate	1113657	503560	1120685
Other	Light alcohol	1203953	544389	211527
	Heavy Alcohol	122067	55195	83665
	Fuel Oil	168142	76028	169200
			Relative BTU's	
Feeds		RFD1	RFD2	RFD3
Landed Gas		7163520	3239113	7208585
Landed Condensate		1404132	634903	1412966
Electrical Import		269716	121957	271413

Query 7

Oxygen Content.

The RFD diesel fuels are free of oxygenates with the exception of RFD 3 that contains 1.18 % m/m oxygen as 5% v/v of Mosstanol 120 (mixed alcohols) has been added to the synthetic diesel.

Query 8

Hydrocarbon Type.

As described in our original submission, dated Sept. 16, 1999, Table's 2 and 3 indicate that the maximum aromatic content of the fuels will not be greater than 18 volume percent maximum as tested by IP 391. Typically the aromatic content will range from 10 to 15 % v/v aromatics. It should be noted that these aromatics would only be present in the form of mono-aromatics, further that the fuels are free of poly-hydrocarbons (PAH's) or other priority pollutant's as analysed by GC/MS. The fuels having been hydrotreated are free of any olefins, the majority of the Mossgas RFD fuels consisting of iso-paraffins.

Query 9

Biodegradability.

Table 5 indicates the ability for the distillate products to biodegrade. Tests were performed at STL Runcorn using the 28-Day Freshwater Aerobic Biodegradability Test (OECD 301 D) and the 58-Day Anaerobic Biodegradability Test (ISO/TC147/SC5N98).

Table 5

	AEROBIC DEGRADATION		ANAEROBIC DEGRADATION	
Sample Concentration	*2 mg/l*	*5 mg/l*	*5 mg/l*	*10 mg/l*
Diesel COD	35.3%	42.5%	15.5%	47.2%
Diesel SLO	38.8%	13.0%	22.6%	16.7%
Diesel RFD1	9.0%	35.8%	9.1%	49.1%
Kerosene – Mossgas	59.2%	38.9%	81.5%	12.1%

Mosstanol 120 being highly biodegradable has not been tested for either aerobic or anaerobic biodegradability. One of the commercial applications of Mosstanol 120 is as a co-feed to industrial sewage treatment plants to increase plant processing capacity. Mosstanol 120 is an exceptionally friendly source of carbon and is used to boost the denitrification ability of treatment plants. Independent tests performed at the Council for Scientific and Industrial Research proves that Mosstanol 120 boosts denitrification activity and support's further phosphate and sulphate removal. The presence of Mosstanol 120 in any organic product will boost the ability to biodegrade.

Query 10

MSDS's.

Generic MSDS exist for the Mossgas RFD diesel fuels, please find attached the MSDS's.

Emission Outputs for Mossgas Fischer-Tropsch Fuels.

Table 6 indicates the relative fuel emission outputs of the Mossgas Fischer-Tropsch Diesel Fuels. Pollutants such as methane, benzene, 1,3 butadiene, formaldehyde, acetaldehyde and acrolein were not measured, as these pollutants are normally associated with spark induced engines.

Table 6

			Emissions Results (g/mile)					Fuel Economy	
Unmodified Bus#1	Cycle	Fuel	HC	CO	CO_2	NOx	PM	Mile/ Gal	BTU/ mile
	CBD	D2	1.02	39.4	5059	27.5	10.0	1.99	65456
	CBD	RFD 1	0.90	32.5	4908	26.5	8.86	1.86	66365
	CBD	RFD 3 (5% Mosstanol)	0.96	21.8	5034	26.9	7.45	1.82	67820
	CBD	D2	1.33	39.9	4896	26.3	8.93	2.05	63398
	CBD	RFD	1.07	33.2	4771	24.8	8.56	1.91	64549
	%Reduction RFD 1 over D2		-16.2	-17.2	-2.8	-4.7	-8.0		
	%Reduction RFD 3 over D2		-18.3	-45.0	1.1	0.0	-21.3		
Catalytic Converter Equipped Bus#2	CBD	D2	0.43	1.72	4356	26.8	1.69	2.33	55705
	CBD	RFD 1	0.40	0.38	4347	25.2	1.27	2.12	58157
	CBD	RFD 3 (5% Mosstanol)	0.42	0.27	4367	26.6	0.97	2.11	58424
	CBD	D2	0.35	1.07	4458	26.9	1.89	2.28	56995
	%Reduction RFD 1 over D2		2.6	-72.8	-1.4	-6.2	-29.1		
	%Reduction RFD 3 over D2		7.7	-80.7	-0.9	-0.9	-45.8		

Note: the above table was used in our original submission dated 16 September 1999. Further information as tested over a variety of drive cycles is available in this petition.

Gasoline 97 octane emissions are included in Table 7 as tested in strict compliance to the ECE 15 testing procedure on a non-catalytic vehicle. Pollutants are expressed as grams per kilometer during the driving cycle.

Table 7

HC (g/kilometre)	CO (g/kilometre)	CO_2 (g/kilometre)	NOx (g/kilometre)	Methane (g/kilometre)	1,3 Butadiene (g/kilometre)	Benzene (g/kilometre)
1.13	20.7	238	2.47	0.059	0.010	0.028

Sincerely

Cyril Knottenbelt
Research Chemist

Ross Murdoch
Lead Process Engineer

MATERIAL SAFETY DATA SHEET

MOSSGAS RFD 1 DIESEL

Date Issued 9July 2001

Company Details

Name	MOSSGAS (PTY) LTD	Emergency Phone Number	+27-44-6012222
Address	Mossgas Refinery Site	Tel	+27-44-6013472
	Duinzicht Avenue	Fax	+27-44-6012058
	Mossel Bay 6500		
	Republic of South Africa		

1. Product and Company Identification:

Trade / commercial Name	MOSSGAS RFD 1 DIESEL
Chemical Name	Acyclic Saturated Hydrocarbons.
Synonyms	SYNTHETIC PARAFFINIC HYDROCARBON
Un No	**1980**
DOT Hazard	Not Classified
SA Standard (SABS 0228)	CLASS 3.4 (High Flash point exceeding 61°C up to 100°C)
Hazchem Code	3Z
NAERG	GUIDE 128

2. CAS NUMBER: 68 476 302

3. Hazards Identification

Fire:	Combustible Liquid. Flammable when exposed to heat or flame. Can react vigorously with strong oxidizing agents. Combustion will produce CO and other asphyxiants. Fire could produce irritating or poisonous gases. Runoff from fire-control or dilution water could cause pollution.
Inhalation:	Could be poisonous if inhaled or absorbed through skin. Vapours could cause dizziness or suffocation. Excessive exposures may cause irritation to eyes, nose throat and lungs, headache, nausea, unconsciousness, even respiratory failure and possibly death. (central nervous system effects)
Skin contact	Contact could irritate or burn to skin. Prolonged or repeated contact may cause irritation or even dermatitis.
Eye contact:	Eye irritation.
Ingestion:	Harmful, even fatal if swallowed. Central nervous system effects. Same as for inhalation.

4. First Aid Measures

First Aid Skin	Promptly remove contaminated clothing. Wash affected area with copious amounts of water and soap until no odour remains. If redness or swelling occurs, obtain medical attention.. In case of burns, immediately cool skin as long as possible with cold water. Seek immediate medical attention.
First Aid Eyes	Flush eyes under running water for 15 minutes. Hold both eyelids open. Continue irrigating. Seek immediate medical attention.
First Aid Ingested	Do not induce vomiting Do not give liquids. Small amounts which accidentally enter the mouth, should be rinsed out until taste of diesel is gone. **Consult doctor/medical service if you feel unwell.**

5. Fire Fighting Measures

Small fires:	Dry chemical, CO_2, Halon, water spray or standard foam.
Large fires:	Water spray, fog or alcohol foam is recommended. Move container from fire area if you can do it without risk. Cool containers that are exposed to flames with water from the side until well after the fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection.

6. Accidental Release Measures

Contain (avoid spillage from entering drains or water courses) Restrict access to area. Provide adequate protective equipment and ventilation. Remove sources of heat and flame. Contaminated soil to be excavated and transported to a hazardous materials waste disposal site. Dispose by incineration.

Spill or leak: Shut off ignition sources; no flares, smoking or flames in hazard area. Stop leak if you can without risk. Water spray may reduce vapor; but it may not prevent ignition in closed spaces.

Small spills: Take up with sand or other inert material. Collect and deposit in sealed containers for disposal.

Large spills: Dike far ahead of liquid spill for later disposal.

7. Handling And Storage

Storage in the same storage space is prohibited with the following classes: The rooms or spaces should be at least 10m apart.

Explosives	Poisonous Gases
Oxidizing Agents	Organic Peroxides
Radioactive	Corrosives

Avoid contact with strong oxidizers. Store in tightly closed, approved metal containers in a cool, well-ventilated area. Keep away from heat, sparks and open flames. Metal contains should be bonded before decanting/transferring the product. Avoid prolonged inhalation fog mist or vapour. Avoid prolonged or repeated contact with the skin. Wash thoroughly after handling.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits 100ppm

Controls: The control measures appropriate for a particular worksite depends on how this material is used and on the extent of exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside. Supply sufficient replacement air to make up for air removed. Have a safety shower/eye wash fountain readily available in the immediate work area

Personal Protection: If engineering controls and work practices are not effective in controlling this material, then wear suitable personal protection equipment, including chemical safety goggles & face shield, boots, imperious gloves, coveralls, & respiratory protection. Have appropriate equipment available for use in emergencies.

9. Physical & Chemical Properties

Boiling Range °C	(°F)	220 - 365	(428 - 689)
Flash Point °C	(°F)	62 (min)	(144)
Relative density (water = 1)		0,80 (typical)	
Relative vapour density (air = 1)		8	
Vapour pressure in mm Hg @ 20°C		1.6	
Freezing point °C	(°F)	minus 30 C	(-22)
Physical state and appearance		Light amber liquid.. Insoluble in water	

10. Stability And Reactivity

Conditions to Avoid: Avoid contact with strong oxidizers. **Stable under normal conditions**

Incompatible Materials: Strong oxidizers.**On burning releases carbon monoxide and carbon dioxide.**

11. Toxicological Information

Routes of entry: Inhalation of vapour, ingestion, eye and skin contact.

Chronic effects on humans: Not a suspected human carcinogen

Other Toxic Effects: Aggravates pre-existing medical disorders of the skin, eye, nervous system, respiratory/pulmonary.system

12. Disposal Considerations

Disposal Method Product Disposal in accordance with local legal provisions. Incinerate.

13. Transport Information

UN No	1993
Hazchem Code	3Z
NAERG	128
Hazard label	Not Required
NAERG	128
IMDG Code	Not Classified
IMDG-Packaging Group	Not Listed
Marine pollutant	Not Listed
DOT HAZARD	Not Classified

Passenger Instruction = 309 for passenger aircraft (60 litres On Passenger)
Passenger Instruction = 310 for cargo aircraft (220 litres on cargo aircraft)

14. Regulatory Information

ENVIRONMENTAL STANDARDS

A. SARA TITLE III

1. EHS (EXTREMELY HAZARDOUS SUBSTANCES) LIST: Not Listed (EPA, 1996f)

2. SECTION 313: Not Listed (EPA, 1996g)

B. CERCLA; HAZARDOUS SUBSTANCES and REPORTABLE QUANTITIES: Not Listed (EPA, 1996e)

C. RCRA HAZARDOUS WASTE NUMBER: Not Listed (EPA, 1996; EPA, 1996a; EPA, 1996b; EPA, 1996c; EPA, 1996d)

D. TSCA INVENTORY: Listed (LOLI, 1996)

E. AIHA ERPG VALUES: Not Listed (AIHA, 1996)

F. DOT List of Marine Pollutants: Not Listed (DOT, 1996a)

15.Other Information

Hazard Classification	Not Required
Risk Phrases	Not Required
Safety Phases	S9 Keep container in a well-ventilated place **S(02) Keep out of reach of children.** **S23 Do not breathe vapour** **S24 Avoid contact with skin** **S62 If swallowed do not induce vomiting**

NOTE. The information contained herein has been presented in good faith and is to the best of MOSSGAS (PTY) LTD's knowledge true and accurate. It is provided for informational purposes only and without warranty whatsoever. MOSSGAS (PTY) LTD does not accept responsibility or liability whatsoever which may result from the use of this information. If in doubt, please contact MOSSGAS (PTY) LTD or supplier as given on page 1 in this data sheet.

MATERIAL SAFETY DATA SHEET

MOSSGAS RFD 2 DIESEL

Date Issued 9July 2001

Company Details

Name MOSSGAS (PTY) LTD
Address Mossgas Refinery Site
Duinzicht Avenue
Mossel Bay 6500
Republic of South Africa

Emergency Phone Number +27-44-6012222
Tel +27-44-6013472
Fax +27-44-6012058

1. Product and Company Identification:

Trade / commercial Name	MOSSGAS RFD 2 DIESEL
Chemical Name	Acyclic Saturated Hydrocarbons.
Synonyms	SYNTHETIC PARAFFINIC HYDROCARBON
Un No	**1980**
DOT Hazard	Not Classified
SA Standard (SABS 0228)	CLASS 3.4 (High Flash point exceeding 61°C up to 100°C)
Hazchem Code	**3Z**
NAERG	GUIDE 128

2. CAS NUMBER: 68 476 302

3. Hazards Identification

Fire:	Combustible Liquid. Flammable when exposed to heat or flame. Can react vigorously with strong oxidizing agents. Combustion will produce CO and other asphyxiants. Fire could produce irritating or poisonous gases. Runoff from fire-control or dilution water could cause pollution.
Inhalation:	Could be poisonous if inhaled or absorbed through skin. Vapours could cause dizziness or suffocation. Excessive exposures may cause irritation to eyes, nose throat and lungs, headache, nausea, unconsciousness, even respiratory failure and possibly death. (central nervous system effects)
Skin contact	Contact could irritate or burn to skin. Prolonged or repeated contact may cause irritation or even dermatitis.
Eye contact:	Eye irritation.
Ingestion:	Harmful, even fatal if swallowed. Central nervous system effects. Same as for inhalation.

4. First Aid Measures

First Aid Skin	Promptly remove contaminated clothing. Wash affected area with copious amounts of water and soap until no odour remains. If redness or swelling occurs, obtain medical attention.. In case of burns, immediately cool skin as long as possible with cold water. Seek immediate medical attention.
First Aid Eyes	Flush eyes under running water for 15 minutes. Hold both eyelids open.. Continue irrigating. Seek immediate medical attention.
First Aid Ingested	Do not induce vomiting Do not give liquids. Small amounts which accidentally enter the mouth, should be rinsed out until taste of diesel is gone. **Consult doctor/medical service if you feel unwell.**

5. Fire Fighting Measures

Small fires:	Dry chemical, CO2, Halon, water spray or standard foam.
Large fires:	Water spray, fog or alcohol foam is recommended. Move container from fire area if you can do it without risk. Cool containers that are exposed to flames with water from the side until well after the fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection.

6. Accidental Release Measures

Contain (avoid spillage from entering drains or water courses) Restrict access to area. Provide adequate protective equipment and ventilation. Remove sources of heat and flame. Contaminated soil to be excavated and transported to a hazardous materials waste disposal site. Dispose by incineration.

Spill or leak: Shut off ignition sources; no flares, smoking or flames in hazard area. Stop leak if you can without risk. Water spray may reduce vapor; but it may not prevent ignition in closed spaces.

Small spills: Take up with sand or other inert material. Collect and deposit in sealed containers for disposal.

Large spills: Dike far ahead of liquid spill for later disposal.

7. Handling And Storage

Storage in the same storage space is prohibited with the following classes: The rooms or spaces should be at least 10m apart.

Explosives	Poisonous Gases
Oxidizing Agents	Organic Peroxides
Radioactive	Corrosives

Avoid contact with strong oxidizers. Store in tightly closed, approved metal containers in a cool, well-ventilated area. Keep away from heat, sparks and open flames. Metal contains should be bonded before decanting/transferring the product. Avoid prolonged inhalation fog mist or vapour. Avoid prolonged or repeated contact with the skin. Wash thoroughly after handling.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits 100ppm

Controls The control measures appropriate for a particular worksite depends on how this material is used and on the extent of exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside. Supply sufficient replacement air to make up for air removed. Have a safety shower/eye wash fountain readily available in the immediate work area

Personal Protection If engineering controls and work practices are not effective in controlling this material, then wear suitable personal protection equipment, including chemical safety goggles & face shield, boots, imperious gloves, coveralls, & respiratory protection. Have appropriate equipment available for use in emergencies.

9. Physical & Chemical Properties

Boiling Range °C	(°F)	220 - 365	(428 - 689)
Flash Point °C	(°F)	62 (min)	(144)
Relative density (water = 1)		0,80 (typical)	
Relative vapour density (air = 1)		8	
Vapour pressure in mm Hg @ 20°C		1.6	
Freezing point °C	(°F)	minus 30 C	(-22)
Physical state and appearance		Light amber liquid.. Insoluble in water	

10. Stability And Reactivity

Conditions to Avoid Avoid contact with strong oxidizers. **Stable under normal conditions**

Incompatible Materials Strong oxidizers.**On burning releases carbon monoxide and carbon dioxide.**

11. Toxicological Information

Routes of entry Inhalation of vapour, ingestion, eye and skin contact.

Chronic effects on humans Not a suspected human carcinogen

Other Toxic Effects Aggravates pre-existing medical disorders of the skin, eye, nervous system, respiratory/pulmonary.system

12. Disposal Considerations

Disposal Method Product Disposal in accordance with local legal provisions. Incinerate.

13. Transport Information

UN No	1993
Hazchem Code	3Z
NAERG	128
Hazard label	Not Required
NAERG	128
IMDG Code	Not Classified
IMDG-Packaging Group	Not Listed
Marine pollutant	Not Listed
DOT HAZARD	Not Classified

Passenger Instruction = 309 for passenger aircraft (60 litres On Passenger)
Passenger Instruction = 310 for cargo aircraft (220 litres on cargo aircraft)

14. Regulatory Information

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E. AIHA ERPG VALUES: Not Listed (AIHA, 1996)

F. DOT List of Marine Pollutants: Not Listed (DOT, 1996a)

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Safety Phases	S9 Keep container in a well-ventilated place **S(02) Keep out of reach of children.** **S23 Do not breathe vapour** **S24 Avoid contact with skin** **S62 If swallowed do not induce vomiting**

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MATERIAL SAFETY DATA SHEET

MOSSGAS RFD 3 DIESEL

Date Issued 9July 2001

Company Details

Name MOSSGAS (PTY) LTD
Address Mossgas Refinery Site
Duinzicht Avenue
Mossel Bay 6500
Republic of South Africa

Emergency Phone Number +27-44-6012222
Tel +27-44-6013472
Fax +27-44-6012058

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Trade / commercial Name	MOSSGAS RFD 3 DIESEL
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2. CAS NUMBER: 68 476 302

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First Aid Ingested: Do not induce vomiting Do not give liquids. Small amounts which accidentally enter the mouth, should be rinsed out until taste of diesel is gone. **Consult doctor/medical service if you feel unwell.**

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Oxidizing Agents	Organic Peroxides
Radioactive	Corrosives

Avoid contact with strong oxidizers. Store in tightly closed, approved metal containers in a cool, well-ventilated area. Keep away from heat, sparks and open flames. Metal contains should be bonded before decanting/transferring the product. Avoid prolonged inhalation fog mist or vapour. Avoid prolonged or repeated contact with the skin. Wash thoroughly after handling.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits 100ppm

Controls: The control measures appropriate for a particular worksite depends on how this material is used and on the extent of exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside. Supply sufficient replacement air to make up for air removed. Have a safety shower/eye wash fountain readily available in the immediate work area

Personal Protection: If engineering controls and work practices are not effective in controlling this material, then wear suitable personal protection equipment, including chemical safety goggles & face shield, boots, imperious gloves, coveralls, & respiratory protection. Have appropriate equipment available for use in emergencies.

9. Physical & Chemical Properties

Boiling Range °C	(°F)	80 – 365	(176 - 684)
Flash Point °C	(°F)	24 (min)	(75)
Relative density (water = 1)		0,80 (typical)	
Relative vapour density (air = 1)		8	
Vapour pressure in mm Hg @ 20°C		1.6	
Freezing point °C	(°F)	minus 30 C	(-22)
Physical state and appearance		Light amber liquid.. Insoluble in water	

10. Stability And Reactivity

Conditions to Avoid: Avoid contact with strong oxidizers. **Stable under normal conditions**

Incompatible Materials: Strong oxidizers.**On burning releases carbon monoxide and carbon dioxide.**

11. Toxicological Information

Routes of entry: Inhalation of vapour, ingestion, eye and skin contact.

Chronic effects on humans: Not a suspected human carcinogen

Other Toxic Effects: Aggravates pre-existing medical disorders of the skin, eye, nervous system, respiratory/pulmonary.system

12. Disposal Considerations

Disposal Method Product Disposal in accordance with local legal provisions. Incinerate.

13. Transport Information

UN No	1993
Hazchem Code	3Z
NAERG	128
Hazard label	Not Required
NAERG	128
IMDG Code	Not Classified
IMDG-Packaging Group	Not Listed
Marine pollutant	Not Listed
DOT HAZARD	Not Classified

Passenger Instruction = 309 for passenger aircraft (60 litres On Passenger)
Passenger Instruction = 310 for cargo aircraft (220 litres on cargo aircraft)

14. Regulatory Information

ENVIRONMENTAL STANDARDS

A. SARA TITLE III

1. EHS (EXTREMELY HAZARDOUS SUBSTANCES) LIST: Not Listed (EPA, 1996f)

2. SECTION 313: Not Listed (EPA, 1996g)

B. CERCLA; HAZARDOUS SUBSTANCES and REPORTABLE QUANTITIES: Not Listed (EPA, 1996e)

C. RCRA HAZARDOUS WASTE NUMBER: Not Listed (EPA, 1996; EPA, 1996a; EPA, 1996b; EPA, 1996c; EPA, 1996d)

D. TSCA INVENTORY: Listed (LOLI, 1996)

E. AIHA ERPG VALUES: Not Listed (AIHA, 1996)

F. DOT List of Marine Pollutants: Not Listed (DOT, 1996a)

15.Other information

Hazard Classification	Not Required
Risk Phrases	Not Required
Safety Phases	S9 Keep container in a well-ventilated place **S(02) Keep out of reach of children.** **S23 Do not breathe vapour** **S24 Avoid contact with skin** **S62 If swallowed do not induce vomiting**

NOTE. The information contained herein has been presented in good faith and is to the best of MOSSGAS (PTY) LTD's knowledge true and accurate. It is provided for informational purposes only and without warranty whatsoever. MOSSGAS (PTY) LTD does not accept responsibility or liability whatsoever which may result from the use of this information. If in doubt, please contact MOSSGAS (PTY) LTD or supplier as given on page 1 in this data sheet.