SGS Redwood Ltd

Environmental Services

Rossclife Road
Ellesmere Port,
South Wirral L65 3AS.
Tel: 051 355 4931
Telex: 627250
Fax: 051 356 3253

Dipetane International Limited
Orchard House
Clonskeagh Square
Dublin 14
Co Dublin
Ireland

Attn: Mr K Somerford

9th August 1990

Analytical Report No: EN 1714/2

Ref: Exhaust Gas Analysis

In accordance with your instructions we certify that we have carried out analyses on the exhaust gases of a selected company vehicle before and after the addition of Dipetane and the results are as follows:-

1) Before addition of Dipetane

	HGV Diesel
Oxygen % vol	17.93
Nitrogen % vol	77.89
Carbon Monoxide % vol	0.03
Carbon Dioxide % vol	1.85
$N\text{-}NO_x$ µg/l of Gas	10.7
SO_x µg/l of Gas as SO_3	34.0

Continued....

Analytical Report No EN 1714/2 9th August 1990

2) After addition of Dipetane (at a ratio of 1:160)

	HGV Diesel
Oxygen % vol	19.66
Nitrogen % vol	76.55
Carbon Monoxide % vol	0.03
Carbon Dioxide % vol	1.39
N-NO_x µg/l of Gas	6.0
SO_x µg/l of Gas as SO_3	25.4
*Sulphur mg/kg	2100
Distance performed during test in miles	970

*NB Sulphur determination was carried out on a sample of fuel drawn from the vehicle at the time of testing after trial.

The methods of sampling/analysis used were as follows:-

In all cases the car engine was warm and left at idling speed for 10-15 minutes prior to commencement of sampling.

For O_2, N_2, CO and CO_2 determinations a 10 lit gas bag was connected to the tail-pipe and filled over a period of 2-3 minutes. This sample was then analysed by Gas Chromatography.

For SO_x determinations the exhaust gas was sampled from the tail-pipe over a period of 30 minutes at a rate of 0.4 lit/min (ie. total sample 12 lit) through a suitable absorber solution. After this time the SO_x concentration in the absorber solution was determined titrimetrically.

Continued....

Analytical Report No EN 1714/2

9th August 1990

2) After addition of Dipetane (at a ratio of 1:160)

	HGV Diesel
Oxygen % vol	19.66
Nitrogen % vol	76.55
Carbon Monoxide % vol	0.03
Carbon Dioxide % vol	1.39
N-NO_x µg/l of Gas	6.0
SO_x µg/l of Gas as SO_3	25.4
*Sulphur mg/kg	2100
Distance performed during test in miles	970

*NB Sulphur determination was carried out on a sample of fuel drawn from the vehicle at the time of testing after trial.

The methods of sampling/analysis used were as follows:-

In all cases the car engine was warm and left at idling speed for 10-15 minutes prior to commencement of sampling.

For O_2, N_2, CO and CO_2 determinations a 10 lit gas bag was connected to the tail-pipe and filled over a period of 2-3 minutes. This sample was then analysed by Gas Chromatography.

For SO_x determinations the exhaust gas was sampled from the tail-pipe over a period of 30 minutes at a rate of 0.4 lit/min (ie. total sample 12 lit) through a suitable absorber solution. After this time the SO_x concentration in the absorber solution was determined titrimetrically.

Continued....

Analytical Report No EN 1714/2 9th August 1990

For NO_x determinations a similar procedure was used as for SO_x but in this care the sampling time was 10 minutes at a rate of 0.4lit/min (Total Sample 4lit), through a suitable absorber solution. The NO_x concentration in the absorber solution was determined colorimetrically using a UV spectrophotometer at 550 nm.

for SGS REDWOOD LIMITED
Environmental Services

R J Millward

SGS Redwood Ltd

Environmental Services

Rossclife Road.
Ellesmere Port.
South Wirral L66 3AS.
Tel 051 355 4931
Telex 627250
Fax 051 356 3253

Dipetane International Limited
Orchard House
Clonskeagh Square
Dublin 14
Co Dublin
Ireland

Attn: Mr K Comerford

9th August 1990

Analytical Report No: EN 1714/3

Ref: Exhaust Gas Analysis

In accordance with your instructions we certify that we have carried out analyses on the exhaust gases of a selected company vehicle before and after the addition of Dipetane and the results are as follows:-

1) Before addition of Dipetane

	Motor Car Unleaded Petrol
Oxygen % vol	8.30
Nitrogen % vol	79.01
Carbon Monoxide % vol	0.17
Carbon Dioxide % vol	11.26
$N\text{-}NO_x$ µg/l of Gas	1.0
SO_x µg/l of Gas as SO_3	48.1

Continued....

Analytical Report No EN 1714/3 9th August 1990

2) After addition of Dipetane (at a ratio of 1:160)

	Motor Car Unleaded Petrol
Oxygen % vol	10.85
Nitrogen % vol	79.84
Carbon Monoxide % vol	0.16
Carbon Dioxide % vol	8.38
N-NO_x µg/l of Gas	0.7
SO_x µg/l of Gas as SO_3	11.6
*Sulphur mg/kg	336
Distance performed during test in miles	1174

*NB Sulphur determination was carried out on a sample of fuel drawn from the vehicle at the time of testing after trial.

The methods of sampling/analysis used were as follows:-

In all cases the car engine was warm and left at idling speed for 10-15 minutes prior to commencement of sampling.

For O_2, N_2, CO and CO_2 determinations a 10 lit gas bag was connected to the tail-pipe and filled over a period of 2-3 minutes. This sample was then analysed by Gas Chromatography.

For SO_x determinations the exhaust gas was sampled from the tail-pipe over a period of 30 minutes at a rate of 0.4 lit/min (ie. total sample 12 lit) through a suitable absorber solution. After this time the SO_x concentration in the absorber solution was determined titrimetrically.

Continued....

Analytical Report No EN 1714/3 9th August 1990

For NO_x determinations a similar procedure was used as for SO_x but in this care the sampling time was 10 minutes at a rate of 0.4lit/min (Total Sample 4lit), through a suitable absorber solution. The NO_x concentration in the absorber solution was determined colorimetrically using a UV spectrophotometer at 550 nm.

for SGS REDWOOD LIMITED
Environmental Services

R J Millward

SGS Redwood Ltd

Environmental Services

Rosscliffe Road
Ellesmere Port,
South Wirral L65 3AS.
Tel: 051 355 4931
Telex: 627250
Fax: 051 356 3253

Dipetane International Limited
Orchard House
Clonskeagh Square
Dublin 14
Co Dublin
Ireland

Attn: Mr K Comerford

9th August 1990

Analytical Report No: EN 1714/2

Ref: Exhaust Gas Analysis

In accordance with your instructions we certify that we have carried out analyses on the exhaust gases of a selected company vehicle before and after the addition of Dipetane and the results are as follows:-

1) Before addition of Dipetane

	HGV Diesel
Oxygen % vol	17.93
Nitrogen % vol	77.89
Carbon Monoxide % vol	0.03
Carbon Dioxide % vol	1.85
$N\text{-}NO_x$ µg/l of Gas	10.7
SO_x µg/l of Gas as SO_3	34.0

Continued....

Analytical Report No EN 1714/2 9th August 1990

For NO_x determinations a similar procedure was used as for SO_x but in this care the sampling time was 10 minutes at a rate of 0.4lit/min (Total Sample 4lit), through a suitable absorber solution. The NO_x concentration in the absorber solution was determined colorimetrically using a UV spectrophotometer at 550 nm.

for SGS REDWOOD LIMITED
Environmental Services

R J Millward

SGS Redwood Ltd

Environmental Services

Rossclife Road,
Ellesmere Port,
South Wirral L66 3AS.
Tel 051 355 4931
Telex 627250
Fax 051 356 3253

Dipetane International Limited
Orchard House
Clonskeagh Square
Dublin 14
Co Dublin
Ireland

Attn: Mr K Comerford

9th August 1990

Analytical Report No: EN 1714/3

Ref: Exhaust Gas Analysis

In accordance with your instructions we certify that we have carried out analyses on the exhaust gases of a selected company vehicle before and after the addition of Dipetane and the results are as follows:-

1) Before addition of Dipetane

	Motor Car Unleaded Petrol
Oxygen % vol	8.30
Nitrogen % vol	79.01
Carbon Monoxide % vol	0.17
Carbon Dioxide % vol	11.26
$N\text{-}NO_x$ µg/l of Gas	1.0
SO_x µg/l of Gas as SO_3	48.1

Continued....

Analytical Report No EN 1714/3 9th August 1990

2) After addition of Dipetane (at a ratio of 1:160)

	Motor Car Unleaded Petrol
Oxygen % vol	10.85
Nitrogen % vol	79.84
Carbon Monoxide % vol	0.16
Carbon Dioxide % vol	8.38
$N\text{-}NO_x$ µg/l of Gas	0.7
SO_x µg/l of Gas as SO_3	11.6
*Sulphur mg/kg	336
Distance performed during test in miles	1174

*NB Sulphur determination was carried out on a sample of fuel drawn from the vehicle at the time of testing after trial.

The methods of sampling/analysis used were as follows:-

In all cases the car engine was warm and left at idling speed for 10-15 minutes prior to commencement of sampling.

For O_2, N_2, CO and CO_2 determinations a 10 lit gas bag was connected to the tail-pipe and filled over a period of 2-3 minutes. This sample was then analysed by Gas Chromatography.

For SO_x determinations the exhaust gas was sampled from the tail-pipe over a period of 30 minutes at a rate of 0.4 lit/min (ie. total sample 12 lit) through a suitable absorber solution. After this time the SO_x concentration in the absorber solution was determined titrimetrically.

Continued....

Analytical Report No EN 1714/3 9th August 1990

For NO_x determinations a similar procedure was used as for SO_x but in this care the sampling time was 10 minutes at a rate of 0.4lit/min (Total Sample 4lit), through a suitable absorber solution. The NO_x concentration in the absorber solution was determined colorimetrically using a UV spectrophotometer at 550 nm.

for SGS REDWOOD LIMITED
Environmental Services

R J Millward

SGS Redwood Ltd.

Airport Road West,
Sydenham,
Belfast BT3 9ED
Telephone: 0232 453 538
Telex: 747870
Fax: 0232 458 811

Analytical Report No: LBC 5871/92 2 July 1992

PRODUCT : Gas Oil
SOURCE :
DATE SAMPLED : 7 June 1992

TEST	RESULTS		METHO
	A	B	
Specific Gravity @ 60/60 F	0.8470	0.8474	Calc
Density @ 15c	0.8466	0.8470	IP 365
Gross Heat of Comb cal/g	10770	10790	IP 12
Sulphur % wt	0.20	0.20	IP 336

Precision parameters apply in determination of the above results. Also refer to ASTM D3244-90A, IP367/89 and IP standards (Test Methods) Appendix E for utilisation of test data to determine conformance with specifications.

Laboratory Manager
D.C.Brown

For SGS REDWOOD LTD.