



REFINERY GRADE

## DIESEL TREATMENT FOR LUBRICITY & STABILITY

### FOR STANDARD, ULSD & 0.1% SULFUR MGO FUELS

**PRI-D** is a super concentrated, complete diesel fuel treatment for refiners, suppliers and commercial diesel consumers that improves all standard distillate grades, and is especially formulated to overcome the degraded lubricity and thermal stability characteristics of severely hydrotreated 0.1% MGO marine fuels and ultra low sulfur (ULSD) diesel fuels.

First, the refinery grade lubricity additive package of **PRI-D** provides a *maximum* level of effective lubricity protection at the 1:2000 dose rate for all fuel delivery systems.

Second, **PRI-D** is formulated with PRI's exclusive thermal stability technology, essential to improving performance of modern, hydrotreated distillate fuels.

**PRI-D** reacts with fuel upon contact, providing greatly enhanced fuel lubricity and deposit and emissions control benefits demanded by today's engines. The laboratory and field proven benefits are multiple;

- Fuel injection pump wear is reduced as much as 45 percent
- Fuel pump plunger sticking is avoided
- Engines and GTs perform better and last longer
- Carbon and fuel system deposits are prevented
- Fuel stays fresh, ignition quality is improved. Degraded fuels are restored
- Visible smoke opacity and soot fouling is dramatically diminished

**Improved Performance, Maintenance, and Emissions Reductions** – CARB/EPA testing verifies **PRI-D** capability to improve the combustion process for optimum, long-term engine performance and efficiency. In test after test, **PRI-D** is verified to reduce unburned hydrocarbons, carbon monoxide (CO), particulate matter (PM) and oxides of nitrogen (NOx).

**Maximum Lubricity Protection** – The refinery-grade lubricity additive package of **PRI-D** is the *most effective and safest* available today based on extensive oil industry research, field performance experience and HFRR testing. Fuel pump wear is reduced as much as 45 percent. Costly and unsafe catastrophic pump failures are avoided.

**Keeps Fuels At Peak Stability** – **PRI-D** not only prevents fuel degradation in long-term storage, degraded fuels are restored to refinery freshness. **PRI-D** is especially effective in providing the enhanced thermal stability that modern hydrotreated distillate fuels lack. **PRI-D** capability is repeatedly confirmed in independently conducted ASTM D2274 testing.

**Super Concentrated & Safe** – **PRI-D** is super concentrated and cost effective, treating fuel at a 1:2,000 ratio (500 ppm). **PRI-D** contains no potentially damaging cetane improvement additives or harsh solvent chemistries, meeting all major engine manufacturer fuel specifications.





Specifications	
Color & Appearance	Colorless Liquid
Odor	Hydrocarbon
Boiling Point	213 C.
Flash Point	65 C.
Specific Gravity	0.78 – 0.81
Water Solubility	Insoluble
USA DOT ID Number	UN 1268
Class/Division	Combustible Liquid
IMDG	Not classified as dangerous under IMDG regulation
IATA	Not classified as dangerous under IATA regulations

### Dosage Rate:

**PRI-D** is dosed at the rate of 1:2000 (500ppm), regardless of fuel specifications under ASTM D975. The fixed dosage rate was developed in consideration of the fact that diesel fuel characteristics can be widely variable, and that quality standards, as proscribed under ASTM D975 do not completely account for all deficiencies associated with fuel performance.

Hence, optimal protection for fuels deficient in lubricity and thermal stability characteristics is ensured at the 1:2000 dosage rate.

### Dosage Method:

Power Research Inc. recommends dosing of **PRI-D** at the main bunker manifold by means of a safe and easily operated air driven gear pump arrangement. However, **PRI-D** is highly miscible with diesel fuel and may be also be added directly to tanks no greater than 20 minutes prior to fuel addition. Agitation from fuel flow into the tank typically provides a sufficient mixture.

### Quality control:

**PRI-D** is manufactured in accordance with strict, chemical manufacturing standards. Each blend is numbered, and a retain sample is FTIR tested against a laboratory standard to ensure optimal conformance.

### Miscibility:

**PRI-D** is a highly complex blend of organic chemistries that once blended with diesel fuel, will not stratify or separate, even with fuel purification. In fact purification systems remain cleaner and more efficient when processing **PRI-D** treated fuels.



## FORMULATED FOR MAXIMUM 0.1% SULFUR MGO PROTECTION

**PRI-D** lubricity/stability fuel treatment offers unequalled protection against the ravages of poor lubricity, reduced ignition quality, and degraded thermal and physical stability of 0.1% sulfur MGO.

Unlike the crop of new products only recently formulated under an *automotive* HFRR standard, **PRI-D** is *specifically formulated* under a modified HFRR test protocol to meet the much greater demands of *marine fuel pumps* – pumps with output pressures as much as ten times greater than automotive counterparts.

**PRI-D** is backed more than 21 years of research and application in the marine and power generation industries across a broad range of engine types, Tested safe for use by Sulzer/Wartsila, **PRI-D** is the only such chemistry verified under strict EPA and CARB protocols to reduce emissions of NO<sub>x</sub>, CO, HC SO<sub>2</sub> and PM. **PRI-D** has also been tested under stringent guidelines proscribed by the U.S. Nuclear Regulatory Commission for use in nuclear power plant standby generator systems. Today, more than 100 vessel operators worldwide have chosen **PRI-D** to ensure complete protection for their vessels.

FEATURES	PRI-D						
	Amergy	Innospec	Marichem	Chemo	Aderco	Nalfleet	
Year Introduced	<b>1989</b>	2006	2009	2009	2009	2009	2010
Lubricity	X	X	X	X	X	X	X
Maximum Dosage for Marine Fuel Pump Protection	X						
Boosts Thermal Stability	X						
Increases Cetane for Better Ignition Quality & Performance	X						
Reduces Micro-Carbon Residue (MCR)	X						
Prevents Fuel System, Engine System Deposits	X						
Prevents Corrosion	X						
Neutralizes Harmful TAN	X						
Reduces Visible Smoke	X						
Sulzer/Wartsila Tested Safe	X						
EPA/CARB Verified Emissions Reductions: NO <sub>x</sub> , THC, PM, CO	X						

**Client:** Power Research Inc  
**Job Location:** Deer Park, TX, USA  
**Vessel:** Deer Park  
**Our Reference Number:** US785-0037553  
**Lab Reference Number:** 2013-DRPK-016874

**Client Reference Number:**  
None

Description	Method	Test	Result	Units
<b>HFO 04-Oct-2013 Swan Arrow LSMGO Untreated</b> 2013-DRPK-016874-001	AD HOC	Method Name	HFRR	
		Weight Load	500	g
		Run Time	150	min
		Temperature	60	deg_C
		Wear Scar Diameter	510	um
<b>HFO 04-Oct-2013 Swan Arrow LSMGO Treated</b> 2013-DRPK-016874-003	AD HOC	Method Name	HFRR	
		Weight Load	500	g
		Run Time	150	min
		Temperature	60	deg_C
		Wear Scar Diameter	370	um

Signed: \_\_\_\_\_

Intertek  
Robert Burris

Date: \_\_\_\_\_

# FOBAS - Sample Analysis Report



Client **BP SHIPPING LIMITED**

Our Reference **FOHO/10/000266/NJZ** Report Status: <<No Status>>  
 Vessel **BRITISH TENACITY (TEN/** LR: **9285706**

Sample Dispatch Date 15 Jan 2010  
 Lab Receipt Date 18 Jan 2010  
 Courier Used FEDEX 798306064820  
 Dispatched From 0.9KG

Sample No	1	2
Port	Stapleton - New York	Stapleton - New York
Sampling Date	12 Jan 2010	12 Jan 2010
Supplier	HESS OIL	HESS OIL
Barge/Inst	DBL-32	DBL-32
Sample Point Type	TANK	TANK
Sampling Method	Not Stated	Not Stated

**Advised Bunker Details**

Viscosity cSt:	3	3
Density @15oC kg/l:	0.8494	0.8494
Sulphur	0.01	0.01
Quantity MT:	60.700	60.700
Seal Number Lab:	0380997	0380997
Seal Number Vessel:	0380997	0380997
Seal Number Supplier:	NOT STATED	NOT STATED
Seal Number MARPOL:	1786685	1786685

Sample		Required	Tested	Required	Tested
		1	<<No Status>>	2	<<No Status>>
ISO-F Grade		LS		LS	
Lubricity	microns		610		354
Lubricity	microns		610		354

**Comments: Sample 1**

SAMPLE NO 1 : DUPLICATE SAMPLE OF SAMPLE NO FOBAS REF:FOHO/09/005322/CSM

**Comments: Sample 2**

SAMPLE NO 2 : SAMPLE 1 WITH PRI ADDITIVE ( 0.25 ML OF LUBRICITY ADDITIVE IS MIXED WITH 500 ML OF GAS OIL SAMPLE - THE SAMPLE IS STIRRED MECHANICALLY)

Note: The accuracy of the results obtained are dependant on the sample tested being truly representative of the fuel as loaded.To draw representative samples please refer to the FOBAS Sampling Procedures Manual.For further information on the MARPOL Annex VI Reg. 14 & 18 requirements and its on-going developments, please contact your local Lloyd's register FOBAS office orcontact us directly on fobas@lr.org.

This report is also available at <http://www.lroil.com/>

The Lloyd's Register Group of companies, which may be referred to collectively as the 'Lloyd's Register Group'. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or however provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



# INTERIM

Deer Park Technical Center Laboratory

1114 Seaco Avenue  
Deer Park, Texas 77536  
USA  
Tel: (713) 844-3200

## Report of Analysis

**Job Reference:** US785-0018956  
**Job Location:** Deer Park, TX, USA

**Date Job Created:** 28-Aug-2009  
**Job Description:** Analysis only of Lube Oil at Deer Park, TX, USA on 28 August, 2009

**Client:** Power Research Inc.  
**Contact:** Ralph Lewis  
**Address:** 6970 Portwest Dr.  
Suite 180  
Houston, TX 77024  
United States of America

**Customer Reference:**  
N/A

### Sample Summary

Sample Number	Date Completed	Description
2009-DRPK-010186-001	10-Sep-2009	PIRAEUS GREECE
2009-DRPK-010186-002	10-Sep-2009	PIRAEUS GREECE w/ 500ppm PRI-D2K (lot:9248-1)



# Report of Analysis

# INTERIM

<b>Sample ID:</b> 2009-DRPK-010186-001	<b>Date Taken:</b> 28-August-2009
<b>Sample Designated As:</b> Low Sulfur MGO	<b>Date Submitted:</b> 28-August-2009
<b>Vessel/Location:</b> Deer Park	<b>Date Tested:</b> 10-September-2009
<b>Representing:</b> PIRAEUS GREECE	<b>Drawn By:</b> Client

Method	Test	Result	Units
ASTM D2622-05	Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry		
	Sulfur Content	663	mg/kg
ASTM D6079	Lubricity by the High-Frequency Reciprocating Rig (HFRR)		
	Fluid Temperature	60	°C
	Major Axis	0.35	mm
	Minor Axis	0.34	mm
	Wear Scar Diameter	350	um
ASTM D6079	Lubricity by the High-Frequency Reciprocating Rig (HFRR)		
	Fluid Temperature	60	°C
	Stroke Length	2	mm
	Applied Load	500	g
	Test Duration	150	min
	Major Axis	0.62	mm
	Minor Axis	0.55	mm
	Wear Scar Diameter	590	um

<b>Sample ID:</b> 2009-DRPK-010186-002	<b>Date Taken:</b> 31-August-2009
<b>Sample Designated As:</b> Low Sulfur MGO	<b>Date Submitted:</b> 31-August-2009
<b>Vessel/Location:</b> Deer Park	<b>Date Tested:</b> 10-September-2009
<b>Representing:</b> PIRAEUS GREECE w/ 500ppm PRI-D2K (lot:9248-1)	<b>Drawn By:</b> Intertek

Method	Test	Result	Units
ASTM D6079	Lubricity by the High-Frequency Reciprocating Rig (HFRR)		
	Fluid Temperature	60	°C
	Major Axis	0.34	mm
	Minor Axis	0.32	mm
	Wear Scar Diameter	330	um
ASTM D6079	Lubricity by the High-Frequency Reciprocating Rig (HFRR)		
	Fluid Temperature	60	°C
	Stroke Length	2	mm
	Test Duration	150	min
	Major Axis	0.48	mm
	Minor Axis	0.40	mm
	Wear Scar Diameter	440	um

This report has been reviewed for accuracy, completeness, and comparison against specifications when available. The reported results are only representative of the samples submitted for testing and are subject to confirmation upon completion of the final report, which may contain warnings, exceptions and terms and conditions which are pertinent to the data supplied herein. It is the position of Intertek that the final report is the prevailing document, and that the use of interim documents by the client is at their own risk. This report shall not be reproduced except in full without written approval of the laboratory.

Signed: \_\_\_\_\_  
Intertek

Date: \_\_\_\_\_

# LINTEC TESTING SERVICES LTD

Enterprise House, Valley Street North, Darlington,  
County Durham.DL1 1GY. United Kingdom.  
Tel: +44 (0) 1325 390180 Fax: +44 (0) 1325 460055  
Web Site: [www.lintec-group.com](http://www.lintec-group.com)



Dear Mike,

I trust that I find you to be well.

Further to our earlier correspondence I can confirm that we have now completed the requested lubricity analysis on the supplied samples. The samples received were not supplied with any references attached so we have simply referred to them as Sample A and Sample B.

The analysis was conducted using a modified version of the standard IP 450 method so that more severe conditions were applied to the test material. In this particular case the fuel sample was exposed to a 500g load weight over a 150 minute run time period rather than the standard 250g load weight over 75 mins. This particular amendment was specifically requested upon submission of the samples.

The results of the analyses are as stated below:

**Sample A** - Un-treated

Lubricity - 840 $\mu$  Wear Scar.

**Sample A** - Treated

Lubricity - 529 $\mu$  Wear Scar.

**Sample B** - Un-treated

Lubricity - 900 $\mu$  Wear Scar.

**Sample B** - Treated

Lubricity - 571 $\mu$  Wear Scar.

The samples received were dosed upon arrival at our laboratory and in accordance with the recommended dosing levels.

I hope that you find the above information to be of use to you and I will give you a call in due course to discuss our findings.

Best regards,

Michael Green  
Technical Manager  
Lintec Testing Services Ltd  
Tel - +44 (0) 1325 390 184  
Mobile - +44 (0) 7753 914 154  
Fax - +44 (0) 1325 460 055  
e-mail - [mg@lintec-group.com](mailto:mg@lintec-group.com)



## FOBAS - Sample Analysis Report



**Client:** SEACASTLE SINGAPORE PTE LTD

**Our Reference:** FORO/10/000632/CSM

**Report Status** <<No Status>>

**Vessel:** MSC BENEDETTA

**LR:** 9302566

**Sample Dispatch Date :** 12 Feb 2010  
**Lab Receipt Date :** 12 Feb 2010  
**Courier Used :** DHL  
**Dispatched From :** BARCELONA

<u>Sample No</u>	<u>1</u>	<u>2</u>	<u>3</u>
Port	Barcelona	Barcelona	Barcelona
Sampling Date	04 Feb 2010	04 Feb 2010	04 Feb 2010
Supplier	CEPSA	CEPSA	CEPSA
Barge/Inst	SPA BUNKER CUARENTAYUNO	SPA BUNKER CUARENTAYUNO	SPA BUNKER CUARENTAYUNO
Sample Point Type	NOT STATED	NOT STATED	NOT STATED
Sampling Method	Not Stated	Not Stated	Not Stated
<b><u>Advised Bunker Details</u></b>			
Viscosity cSt	NOT STATED	NOT STATED	N/S
Density@15 C kg/l	0.839	0.839	0.839
Sulphur	0.06	N/S	N/S
Quantity MT	100	100	N/S
Seal Number Lab	0385727	0385735	0385723
Seal Number Vessel	0385723	0385723	0385735
Seal Number Supplier	0385735	0385227	0385727
Seal Number MARPOL	NS	NOT STATED	NOT STATED

	Required	Tested	Required	Tested	Required	Tested
<b>Sample</b>		1 << No Status >>		2 << No Status >>		3 << No Status >>
ISO-F Grade	LS					
Lubricity	microns	408		283		384

**Comments:** Sample 1

SAMPLE 1: LSMGO without mixing additive

SAMPLE 2: LSMGO mixed in lab with additive in recommended dose 1: 2000 (additive : LSMGO)

SAMPLE 3: LSMGO received in lab already mixed with additive

AAA: These samples have been analysed to observe the effects of lubricity improver additive (PRI - D) on the lubricity of the fuel.

BBB: Sample.2 results indicate significant improvement in lubricity characteristics of the fuel. It should be noted that the additive was manually stirred and thoroughly mixed before analysing sample. 2

CCC: Use of the additive (PRI - D) in fuel should be referred to the engine manufacturers for use on specific engine type.

**Comments: Sample 2**

Comments as above.

**Comments: Sample 3**

Comments as above.

Note: The accuracy of the results obtained are dependant on the sample tested being truly representative of the fuel as loaded.To draw representative samples please refer to the FOBAS Sampling Procedures Manual.

For further information on the MARPOL Annex VI Reg. 14 & 18 requirements and its on-going developments, please contact

your local Lloyd's register FOBAS office or contact us directly on [fobas@lr.org](mailto:fobas@lr.org)

This report is also available at <http://www.lroil.com>

Lloyds Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the Lloyd's Register Group. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or however provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

# FUEL LUBRICITY

## PRI-D Improves ULSD Fuel Lubricity

**How PRI-D Improves Fuel Lubricity:** PRI-D contains a refinery grade lubricity additive package proven to provide superior lubrication to today’s ULSD diesel fuels.

### HFRR LUBRICITY TEST METHOD

Accepted by SAE and ASTM, the standard test method to measure diesel fuel lubricity is conducted on the High Frequency Reciprocating Rig (HFRR). With HFRR, a ball is placed on a flat surface and rapidly vibrated back and forth with a stroke distance of one millimeter while 200 grams of weight is applied. After a proscribed time period, the flat spot in the ball is measured, establishing the extent to which the additive has reduced wear rates.



### HFRR PRI-D TEST RESULTS

Fuel	Additive	Dosage (ppm)	microns	% Wear Reduction
West Coast ULSD	Untreated	0	761	
West Coast ULSD	<b>PRI-D</b>	500	531	<b>30.22</b>

Fuel	Additive	Dosage (ppm)	WSD - microns	% Wear Reduction
Canadian ULSD	Untreated	0	576	
Canadian ULSD	<b>PRI-D</b>	500	353	<b>38.72</b>

Fuel	Additive	Dosage (ppm)	WSD - microns	% Wear Reduction
Northwest ULSD	Untreated	0	684	
Northwest ULSD	<b>PRI-D</b>	500	443	<b>35.23</b>

Fuel	Additive	Dosage (ppm)	WSD - microns	% Wear Reduction
Eastern ULSD	Untreated	0	604	
Eastern ULSD	<b>PRI-D</b>	500	329	<b>45.53</b>

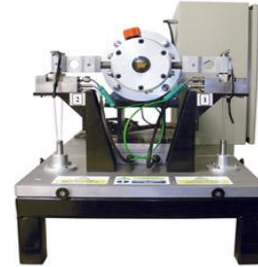
Fuel	Additive	Dosage (ppm)	WSD - microns	% Wear Reduction
Southwestern ULSD	Untreated	0	607	
Southwestern ULSD	<b>PRI-D</b>	500	483	<b>20.43</b>

# HFRR TESTING - STANDARD AND MODIFIED

## STANDARD HFRR TEST - NAIAS

KOEHLER TEST INSTRUMENT - 200g load - 75 minutes

Fuel	Wear Scar (microns)	Percent Improvement
BASILINE FUEL	<b>558</b>	
INNOSPEC	334	40.1
MARICHEM FOT	305	45.3
CHEMO FUEL TREAT	306	45.2
AMERGY XLS	318	43.0
<b>PRI-D</b>	<b>288</b>	<b>48.4</b>



## STANDARD HFRR TEST - INSPECTORATE

PCS TEST INSTRUMENT - 200g load - 75 minutes

Fuel	Wear Scar (microns)	Percent Improvement
BASILINE FUEL	<b>569</b>	
INNOSPEC	413	27.4
MARICHEM FOT	<b>394</b>	<b>30.8</b>
CHEMO FUEL TREAT	389	31.6
AMERGY XLS	372	34.6
<b>PRI-D</b>	<b>357</b>	<b>37.3</b>



## MODIFIED HFRR TEST - TECHNICAL UNIVERSITY OF ATHENS

PCS TEST INSTRUMENT - 500 g load - 150 minutes

Fuel	Wear Scar (microns)	Percent Improvement
BASILINE FUEL	<b>520</b>	
MARICHEM FOT	<b>435</b>	<b>16.3</b>
<b>PRI-D</b>	<b>336</b>	<b>35.4</b>





**NAIAS SCIENTIFIC ANALYTICAL LABORATORIES S.A.**

44, IMITTOU STR. – 18540 PIRAEUS – TEL : +30 210 4100300, FAX : +30 210 4100600, e-mail: info@naiasabs.com



**10MA1134-1139.POW**

**QUALITY CONTROL REPORT  
ON FIVE ADDITIVE SAMPLES  
FOR  
POWER RESEARCH INC  
08 APRIL 2010**

**I.SAMPLE IDENTIFICATION**

On 25.02.2010 NAIAS S.A. received five additive samples carrying the following identification:

<b>10MA1134.POW</b>	<b>10MA1135.POW</b>	<b>10MA1136.POW</b>
LSMGO	LSMGO treated with A	LSMGO treated with B

<b>10MA1137.POW</b>	<b>10MA1138.POW</b>	<b>10MA1139.POW</b>
LSMGO treated with C	LSMGO treated with D	LSMGO treated with PRI-D

*Further to your instructions we proceeded with the preparation of a laboratory ship's tanks composite sample with initial diesel oil and lubricity additive. Analysis listed below was carried out on the composite sample prepared.*

**II.METHODOLOGY AND ANALYSIS RESULTS OF REQUESTED DETERMINATIONS**

<b>SAMPLE</b>	<b>LUBRICITY (wsd 1,4) at 60°C (µm) ASTM D 6079</b>
INITIAL SAMPLE (LSMGO)	558
INITIAL SAMPLE + LSMGO treated with A (1L:10 tonnes)	334
INITIAL SAMPLE + LSMGO treated with B (1L:5 cubic meters)	305
INITIAL SAMPLE + LSMGO treated with C (1:5000)	306
INITIAL SAMPLE + LSMGO treated with D (1:5000)	318
INITIAL SAMPLE + PRI – D (1:2000)	288

With appreciation,  
NAIAS S.A.

**General Terms**

- Comments are issued for consultation purposes only and assume that sample presented is of the indicated type, representative of the material under examination and was drawn from the indicated sampling point.
- The analyses and the results evaluation were carried out following Internal Quality Assurance Procedures and the directives of our BS EN ISO 9001 : 2000 Quality Assurance Certification which has been issued in London by Bureau Veritas Quality International. Precision and accuracy of results lie within limits specified by the corresponding method quoted.
- For safety reasons, remaining portion (if any) of all samples delivered to our laboratories for analyses are kept in storage for ONE WEEK following the reporting date. Subsequently, they are disposed off unless owners have requested in writing their return, which should also take place within the one-week period.
- Our liability is limited to triple the value of the issued invoice.
- All analyses are kept in electronic files for a three year period and our reports include previous results(if any)for comparison purposes. For future reference NAIAS S.A. report codes are printed above the corresponding sample description sections.
- All reports are confidential. The contents of the reports can only be released to third party following written consent of the report owner.
- As of December 2006, original NAIAS reports bear, additionally, company's embossed official seal.



## PRI-D vs. AMERGY XLS

Kyla Shipping, based in Piraeus, Greece, recently conducted a comparison test of **PRI-D** Lubricity/Stability chemistry and Drew Amergy XLS.

0.1% sulfur gas oil was submitted to Inspectorate for HFRR testing. The test protocol was not modified.

Although the recommended dosage rate of **PRI-D** is one liter per 2 mt (1:2000), the **PRI-D** treated sample to be tested was dosed at 1:5000.

The Amergy XLS sample was dosed at the recommended dose rate for the product, one liter per 5 mt (1:5000)

### RESULTS

Baseline (no treatment):	570 microns
Amergy XLS @ 1:5000	448 microns
<b>PRI-D @ 1:5000</b>	<b>430 microns</b>

### DISCUSSION

*Even when applied at the same dosage rate recommended by Drew, **PRI-D** still outperformed Amergy XLS chemistry.*

However, the recommended dosage rate of **PRI-D** is 1:2000, and for a very good reason. The present HFRR standard was designed to correlate directly to wear rates of small automotive rotary pumps. Marine fuel pumps operate under much higher pressures, temperatures and loads, and require a much greater level of lubricity protection.

The 1:2000 dose rate of **PRI-D** was calculated based on a modified protocol of the HFRR test adapted to directly correlate to the much tougher operational challenges of marine fuel pumps.

### CONCLUSION

For optimum lubricity protection of marine fuel delivery systems, the choice is clear. Only **PRI-D** has been specifically formulated to provide proper lubricity protection to the rugged demands of marine fuel pumps. **PRI-D** also has more than 25 years providing lubricity protection to commercial marine vessels – first, in California, and now, worldwide. **PRI-D** also provides a much wider range of benefits, including:

- **OPTIMUM LUBRICITY PROTECTION**
- **AVERAGE 60% IMPROVEMENT – STABILITY (ASTM D2274)**
- **TAN REDUCTION**
- **VERIFIED EMISSIONS REDUCTION (EPA/CARB)**