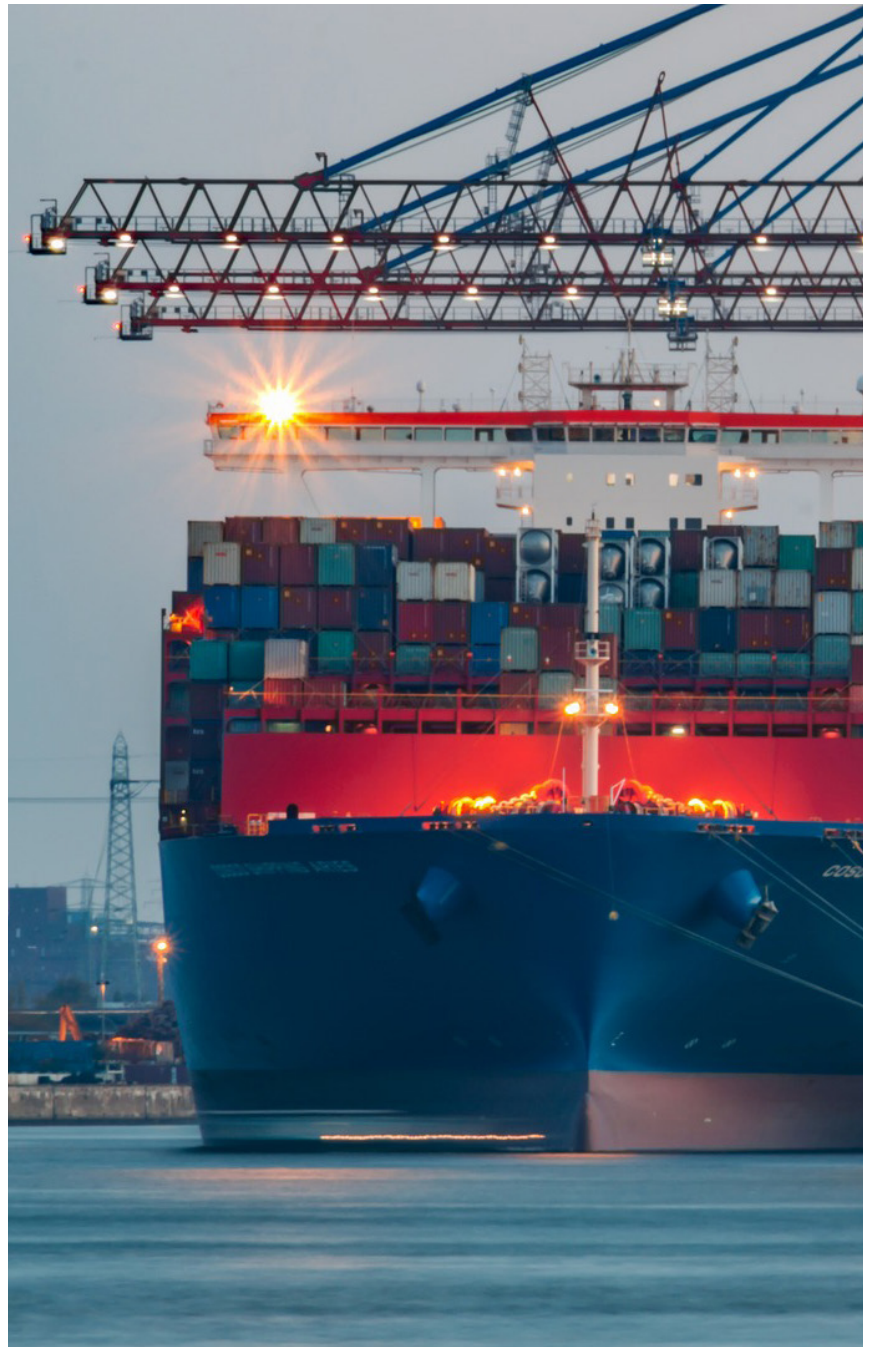




Drew Marine®

Onboard Fuel and Lube Oil Condition Monitoring



Fuel Sampling

Available in an array of sizes, Drew Marine offers cost-effective continuous-drip line samplers that are compliant with MARPOL 73/78 Annex VI – Regulation 18. A representative sample must be collected for each grade of fuel bunkered and retained onboard for one year for every vessel of 400 gross tons and above and every fixed and floating drilling rig and other platforms.

Select the correct sampler by using the inner diameter or flange standard from the two models listed.

CONTINUOUS-DRIP LINE SAMPLERS

The DREW Bunker Sampler has no bolt holes. Based solely on the inner diameter, it is fitted between the bunker manifold flange and bunkering hose flange. The DREW DRIP-TEC, on the other hand, has bolt holes for improved mounting on specific flange standards. It also comes with a quick disconnect coupling for easy Cubitainer receptacle removal. Both models are self-centering and are Type Approved by American Bureau of Shipping (ABS).

When using either model, sampling is carried out by continuous drip during the entire bunkering period. A valve on the sampler is used to adjust the drip rate into either the 5- or 10-liter Cubitainer receptacle connected to the standard thread on the line sampler. A new Cubitainer should be used for each bunkering and each different grade of fuel to avoid cross contamination.



SPECIFICATION	DREW BUNKER SAMPLER	DREW DRIP-TEC
Material	SS 304 SS 316	copper alloy C51180*
Construction	machined	mold casting
Asbestos	none	none
Length	192 mm (2") to 1225 (14")	375 mm (3") to 720 mm (14")**
Width	95 mm (2") to 420 mm (14")	126 mm (3") to 410 mm (14")
Nominal thickness	25 mm – 26 mm	27 mm – 32 mm
Valve lock	optional	included
Mounting	vertical ± 15°	vertical ± 0°
Quick-disconnect	none	yes
Thread	38-400 G.P.I.	38-400 G.P.I.

* Handle & valve fittings: carbon steel

** Excludes 88 mm lifting handle

ORDERING INFORMATION

I. D.	DREW BUNKER SAMPLER	FLANGE STANDARD	DREW DRIP-TEC
80mm (3")	1AB3201	DN 80 PN10 PN16 ANSI 3" 150LB JIS 80 5K JIS 80 10K	1AA7988 1AA7988 1AA7988 1AA7988
100mm (4")	1AB3202	DN 100 PN6 DN 100 PN10 PN16 ANSI 4" 150LB JIS 100 5K JIS 100 10K	1AB6181 1AA7904 1AA7905 1AA7906 1AA7907
125mm (5")	1AB3203	DN 125 PN6 DN 125 PN10 PN16 ANSI 5" 150LB JIS 125 5K JIS 125 10K	1AB6182 1AA7908 1AA7909 1AA7910 1AA7911
150mm (6")	1AB3204	DN 150 PN6 DN 150 PN10 PN16 ANSI 6" 150LB JIS 150 5K JIS 150 10K	1AB6183 1AA7912 1AA7913 1AA7914 1AA7915
200mm (8")	1AB3206	DN 200 PN6 DN 200 PN10 DN 200 PN16 ANSI 8" 150LB JIS 200 5K JIS 200 10K	1AB6184 1AA7916 1AA7917 1AA7918 1AA7919 1AA7920
250mm (10")	1AB3208	DN 250 PN6 DN 250 PN10 DN 250 PN16 ANSI 10" 150LB JIS 250 5K JIS 250 10K	1AB6185 1AA7921 1AA7922 1AA7923 1AA7924 1AA7925
300mm (12")	1AB3210	DN 300 PN6 DN 300 PN10 DN 300 PN16 ANSI 12" 150LB JIS 300 5K JIS 300 10K	1AB6186 1AA7926 1AA7927 1AA7928 1AA7929 1AA7930
350mm (14")	1AB3211	DN 350 PN6 DN 350 PN16 ANSI 14" 150LB JIS 350 10K	1AB6187 1AB4753 1AB4754 1AB4755

Additional sizes are available on request.



Benefits of Onboard Fuel and Lube Oil Testing

Onboard testing is a cost-effective tool for maximizing the value of high-cost fuel and lube oil. Test results allow ship operators to make informed decisions without waiting for the results from shore-based laboratory analysis. Corrective measures can be taken immediately to maintain peak performance for engines and other machinery, while minimizing the risks and costs of damage from deteriorating fuel and lube oil quality.

Designed for marine engineers, contaminant levels and other important oil properties of fuel and lube oil are determined quickly and accurately with results achievable within minutes. Clear test procedures with instructional photographs accompany each test kit to ensure precise and repeatable test results. Supplied with syringes or in pre-measured packs, cost-effective test reagents permit engineers to increase the frequency of their onboard fluid testing to match their condition-based monitoring and reliability goals.

Choose from a range of equipment and test parameters to use either individually, or combined into a multi-parameter testing package. Supplied ready for use, in heavy duty cases, Drew Marine's test kits contain all of the necessary equipment and consumables for an effective onboard oil condition monitoring program. Detecting out-of-spec fuel and lube oil can identify potential problems, before they become critical.

- Fast, accurate results for multiple oil parameters in easy to use kits
- Make informed on-site maintenance and operational decisions
- Act before the onset of critical failure
- Robust and reliable for use in harsh or remote environments

DREW XP FO & LO TEST CABINET

The DREW XP FO & LO Test Cabinet is ideally suited for outfitting newbuildings with essential testing capabilities in a rugged, self-contained, wall-mountable unit. When standardized across all vessels in service, this cost-effective test cabinet offers timely, centralized testing that covers some of the most important tests required for fuel and lube oil. Furthermore, the test cabinet brings essential testing capability on board into the hands of marine engineers, but with the precision

expected from chemists performing the same tests in shore-based analytical laboratories.

For the testing of additional parameters not listed here or for routine ISO 8217:2017 fuel oil analysis of every bunker, please order the Fuel Oil Sample Bottle Kit and contact your nearest Drew Marine representative. Special testing for specific fuel contaminants such as chemical waste, polymers, and biofuel are also available with shore-based fuel oil analysis.

Test Parameter	Fuel Oil	Lube Oil	Range	Test Time	Precision
Density	x	x	800.0 to 1010.0 kg/m ³ @15°C (ISO 8217:2017 DMX to RMK700)	10 min. (heating from 15°C) 30 sec. (repeat test)	± 0.1%
Viscosity	x	x	20 – 810 cSt @50°C (ISO 8217:2017 RMA10 to RMK700) 20 – 810 cSt @40°C (SAE 5 to SAE 50)	3 min. (@40°C, unheated) 10 min. (heating from 25°C) 30 sec. (repeat test)	± 3% (20 – 450 cSt) or ± 2 cSt
Water	x	x	0 – 1% 0 – 10% 0 – 20% 100 – 3,000 ppm 200 – 10,000 ppm	3 min.	± 0.1% ± 1% ± 2% ± 300 ppm ± 1000 ppm
Sea Water Contamination	x	x	Qualitative (Pass / fail)	2 min. (active) 60 min. (settling, unattended) 5 min. (standing, unattended)	Not applicable
Pour Point	x	x	0 - 50°C (ISO 8217:2017 RMA10 to RMK700)	5 min. (cooling intervals, repeated)	± 6°C
Total Base Number (BN)		x	5 – 150 BN	2 min.	± 10% (new oil BN)
Insolubles		x	Qualitative (< 0.1, 1 – 2, or > 2%)	1 min. (active) 20 min. (drying, unattended)	Not applicable
Compatibility	x		#1 – #5 (ASTM D4740 spot rating)	1 min. (active) 20 min. (preheating, drying, unattended)	Not applicable
Calculated Carbon Aromaticity Index (CCAI)	x		Calculated (Use Density Meter with known viscosity value or Viscosity Meter with known density value)		

Benefits of Onboard Fuel and Lube Oil Testing

DREW XP LUBE OIL 5 TEST KIT

Multiple-parameter oil test kits provide an essential condition monitoring tool that enables informed operational and maintenance decisions to be made regarding standard as well as critical machinery. Depending on the criticality, regular onboard lube oil testing provides a cost-effective way to protect shipboard assets, extend drain intervals, improve productivity and increase uptime.

Since lube oil breakdowns or lubrication systems failures can have catastrophic consequences, monitoring lube oil condition in every lube oil system onboard is critical to the well-being of ship engines and all associated auxiliary equipment as well as any lubricated deck machinery. The DREW XP Lube Oil Five Test Kit raises the bar for onboard lube oil quality testing using the most important test parameters for identifying the presence of water and other problems that are likely to diminish service life. Onboard testing is a valuable tool for obtaining accurate, timely information about lube oil contaminants and health.

Increasing the frequency of testing allows operators to monitor lube oil condition more closely when warranted, and take immediate action to prevent lube oil and system breakdown. Run separately in a single specially designed test cell, the tests for water content and total base number provide quantitative values. Results are shown qualitatively in the tests for sea water contamination, insolubles, and viscosity. To positively identify these parameters as individual insoluble contaminants including specific wear metals, order the Lube Analysis Program – Prepaid kit and submit oil samples from the suspected systems. Additional testing for specific parameters such as particle count, ferrography, and micropatch are also available through this program.



Test Parameter	Fuel Oil	Lube Oil	Range	Test Time	Precision
Water	x	x	0 – 1% 0 – 10% 0 – 20% 100 - 3,000 ppm 200 - 10,000 ppm	3 min.	± 0.1% ± 1% ± 2% ± 300 ppm ± 1000 ppm
Sea Water Contamination	x	x	Qualitative (Pass / fail)	2 min. (active) 60 min. (settling, unattended) 5 min. (standing, unattended)	Not applicable
Total Base Number (BN)		x	5 – 150 BN	2 min.	± 10% (new oil BN)
Insolubles		x	Qualitative (< 0.1, 1 – 2, or > 2%)	1 min. (active) 20 min. (drying, unattended)	Not applicable
Viscosity (Relative)		x	Qualitative (Pass / fail)	2 min. (active) 60 min. (settling, unattended)	Not applicable

DREW XP Fuel & Lube Oil Test Cabinet



Drew Marine Onboard Fuel and Lube Oil Testing

ORDERING INFORMATION

Multi-parameter Test Kits			
PCN	Description	Dimensions (cm)	Weight (kg)
1AB6170	DREW XP FO & LO TEST CABINET	74x43x75	50
1AB6168	DREW XP LUBE OIL 5 TEST KIT	47x18x40	5.5

Single Parameter Test Kits			
PCN	Description	Dimensions (cm)	Weight (kg)
1AB2755	DREW XP DENSITY METER	47x18x40	6.1
8552383	FO VISCOMAR VISCOSITY METER	30x20x25	8.5
1AB6169	DREW XP H2O TEST KIT	47x18x40	4.1
1AB2761	DREW XP SW CONTAMINATION TESTER	20x13x6	0.5
1AB6167	DREW XP TBN TEST KIT	38x17x34	3.5
1AB2759	DREW XP INSOLUBLES TESTER	20x13x6	0.2
1AB2185	FUEL OIL COMPATIBILITY TESTER	265x220x182	5.0
1AB2764	DREW XP VISCOSITY EVALUATOR KIT	10x10x30	< 0.2

Reagents and Consumables			
PCN	Description	Dimensions (cm)	Weight (kg)
1AB2733	DREW XP REAGENT H2O-PASTE PACK	31x9x28	1.9
1AB2735	DREW XP REAGENT TBN PACK	31x9x28	1.1
1AB2739	DREW XP TEST SOLVENT PACK	31x9x28	1.0
1AB4428	DREW XP REAGENT WEAR CORROSION	47x18x40	5.0
1AB5968	DREWCAT FINES REAGENT PACK	13x20x5	0.5
1AB2738	DREW XP TEST KIT CLEANER, 2X500ML	31x9x28	1.0
1AB2807	DREW XP TEST PAPER, CHROMATOGRAPHY	5x5x1	< 0.1
1AB2812	DREW XP TEST SYRINGE, 5ML, 40 CT.	13x10x5	0.1
1AB2740	DREW XP TEST SYRINGE, 10ML, 40 CT.	13x20x5	< 0.2
1AB2768	DREW XP WEAR DEBRIS ANALYZER	25x23x8	1.1
1AB4425	DREW XP WEAR CORROSION TESTER	47x18x40	5.0
1AB5967	DREWCAT FINES TESTER	25x23x8	1.0

Related Products			
PCN	Description	Dimensions (cm)	Weight (kg)
1AA9829	FUEL OIL SAMPLE BOTTLE KIT, 40PCS	56x28x55	6.4
1AB2918	LUBE ANALYSIS PROGRAM – PREPAID, 10PK	29x12x13	0.7

OUR VISION

Drew Marine is the most trusted brand and preferred global resource for marine solutions that enhance the longevity and operating efficiency of ocean vessels.

OUR MISSION

To sustain the superiority of the Drew Marine brand by bringing environmentally and technologically superior products and services for the benefit of vessel owners and operators while increasing shareholder value.



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