Other Analysis & Tests

WATER ANALYSIS FOR GAS TURBINES

Nitrogen Oxides, NOx, are the main by-products of the combustion process and environmental issues dictate low NOx emissions. Local regulations vary but NOx are usually held to less than 15 ppm by volume. Injected water or steam can be used to control NOx and turbine manufacturers have water specifications to assure that particulates and other contaminants are not introduced into the turbine.

Purified Water for NOx Suppression **GE MID-TD-0000-3 Specification**

Demineralized Water Analysis, PWPS Specification TPM-AR1

Courtesy sample pick-up in the Houston area.

We invite your inquiry and will be happy to tailor a testing package to your specific needs.

WATER ANALYSIS FOR GAS TURBINES

Compressor Cleaning Water, GE MID-TD-0000-4 Specification

Demineralized Water for NOx Reduction and for Flushing and Washing Water Siemens Specification 970812 AP

Water/Steam Fuel Additive Requirements

Test Code	Description
ASTM D 512	Chloride, Inorganic, in Water and Wastewater
ASTM D 859	Silica in Water and Wastewater
ASTM D 1067	Acidity or Alkalinity of Water
ASTM D 1125	Electrical Conductivity and Resistivity of Water
ASTM D 1293	pH of Water
ASTM D 4691	Trace Elements in Water by Flame Atomic Absorption Spectrophotometry, 14 elements. LOD = 0.5 ppm
ASTM D 5543	Dissolved Oxygen in Water
ASTM D 5907	Filterable and Nonfilterable Matter in Water

	Additional Tests
ASTM D 3919.a	Trace Elements in Water by Graphite Furnace Atomic Absorption Spectrophotometry
ASTM D 2972	Arsenic in Water
ASTM D 3223	Mercury, Total, in Water
ASTM D 3859	Selenium in Water

Please visit our website at www.tol-lp.com for many additional testing packages that we offer. For a test package to meet your specific requirements, please request a quotation

UPSTREAM TESTING SERVICES

Petroleum oils and natural gas are naturally occurring mixtures that are found in deep underground deposits in zones of high temperature and high pressure. The oil and gas industry is based on the extraction, processing, and production of those petroleum fluids.

The typical petroleum fluids are multi-component mixtures consisting of a variety of hydrocarbons and some non-hydrocarbons such as water, nitrogen, carbon dioxide, hydrogen sulfide, and perhaps others. The success to profitable extraction, production, and processing of such petroleum fluids depends on the true understanding of their phase behavior.

The Fluids Laboratory Services Group at Texas OilTech Laboratories now offers specialists for analysis, testing, and consultation in PVT Testing, Reservoir Fluids Analysis, and Enhanced Oil Recovery (EOC). Our ability to create world reservoir conditions – up to 400 °F and 15,000 psi – enables us to handle difficult problems and to customize analytical testing capabilities that are beyond the scope of other laboratories.

Our state-of-the-art instrumentation includes:

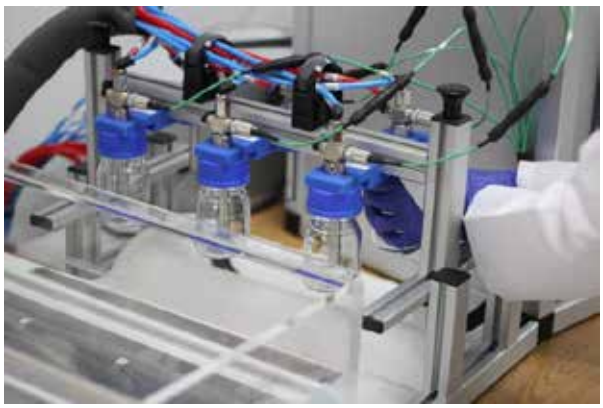
- PVT cells for black and volatile oils
- PVT cells for gases and gas condensates
- PVT cells for rich and lean gases
- Flow assurance equipment
  - Solids detection system (SDS)
  - HTHP microscope
- Crude oil composition
- Interfacial tension
- Core flood systems
- Routine core analysis laboratory

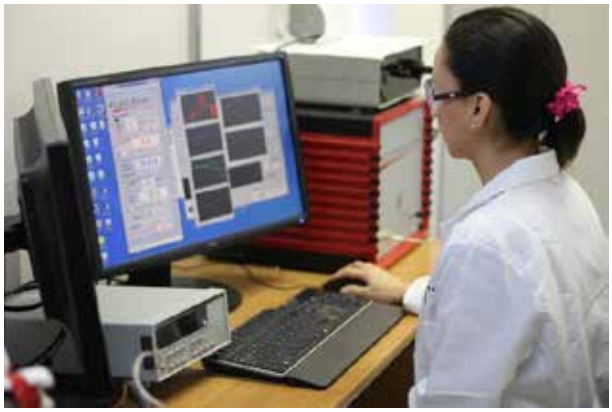
A detailed understanding of the phase behavior of hydrocarbons is essential in predicting optimal conditions for their recovery and processing. While underground petroleum reservoirs can be found at temperatures over 210 °F and at more than 10,000 psi pressure, at surface conditions these fluids are at ambient temperatures and pressures. Hence, these hydrocarbon fluids undergo severe transformations and can exist as single phase (gas, liquid, or solid) or can coexist as liquid plus gas, or as vapor plus solid, or even as liquid-liquid combinations.

Our Fluid Laboratory Services Group can assist you in:

- Reservoir Sampling
- On-site Quality Control Analysis
- Production Support and Optimization
- Specialized Fuel Behavior Studies
- Expert Heavy Oil Analysis

For more details about our Fluids Laboratory Services, please request Catalog B-332.





RESERVOIR FLUID PHASE BEHAVIOR AND PVT STUDIES

Black Oil PVT, Recombined Surface Sample, Complete Study, TOL 3501

Test Code	Description
TOL 3001	Quality check of the fluid samples. Includes opening pressure measurement at 70°F
TOL 3002	Physical recombination of separator oil and gas to the producing gas/oil ratio (GOR)
TOL 3004	Single stage flash for determination of produces gas/oil ratio (GOR), formation volume factor (FVF), and effluent specific gravity by separator oil flash from separator conditions to ambient
TOL 3005	Bubble point pressure (BP) by Constant Compression Expansion (CCE) of the reservoir fluid. Includes additional determination of oil density, compressibility above the bubble point, Y-function below the bubble point.
TOL 3006	Differential Liberation Expansion (DLE) study of solution gas at reservoir temperature and at pressure steps between the bubble point pressure and the atmospheric pressure to determine the solution GOR, formation volume factors (gas, oil, and total), and evolved gas properties
TOL 3007	Reservoir oil viscosity measurements, made during the depletion study
TOL 3009.	Compositional analysis of the evolved gas and stock tank oil (STO) resulting from the reservoir fluid flash to ambient conditions. Includes: separator gas to C_{11}^+, oil to C_{31}^+, reservoir fluid composition through C_7^+, calculated
TOL 3011	Separator pressure test set-up and first pressure test as required with the Differential Liberation Expansion (DLE) study
TOL 3012	Optimum separator pressure determination at room temperature. Includes up to four single stage flash liberation tests from the bubble point pressure to the specified separator pressure

Additional Tests

TOL 3013	Additional tests for separator pressure determination at defined pressure stages
TOL 3014	Single phase sample transfer at reservoir temperature from sample transport cylinder to PVT cell
TOL 3015	Sample storage/conditioning in PVT cell, per customer's request (daily charge)

Black Oil PVT, Recombined Surface Sample, Basic Study, TOL 3502

Test Code	Description
TOL 3001	Quality check of the fluid samples. Includes opening pressure measurement at 70°F
TOL 3002	Physical recombination of separator oil and gas to the producing gas/oil ratio (GOR)
TOL 3004	Single stage flash for determination of produces gas/oil ratio (GOR), formation volume factor (FVF), and effluent specific gravity by separator oil flash from separator conditions to ambient
TOL 3005	Bubble point pressure (BP) by Constant Compression Expansion (CCE) of the reservoir fluid. Includes additional determination of oil density, compressibility above the bubble point, Y-function below the bubble point.
TOL 3009	Compositional analysis of the evolved gas and stock tank oil (STO) resulting from the reservoir fluid flash to ambient conditions. Includes: separator gas to C_{11}^+, oil to C_{31}^+, reservoir fluid composition through C_7^+, calculated

FLOW ASSURANCE STUDIES AND SARA ANALYSIS

Oil field operations often begin to experience solids deposition – primarily wax, asphaltene, and scale – within flow lines and other equipment. Frequent maintenance and cleaning operations are necessary. Sometimes hourly filter changes may require that production is shut down or diverted.

To mitigate solids deposition in production, a study of asphaltene-wax-scale inhibitors can be carried out in the laboratory where low dosages can be injected at specified conditions of temperature and pressure. These inhibitors are chemical compounds that prevent the deposits from flocculating. The advantages for using such deposit treatment chemicals are:

- Reduction in deposition of solids which helps to maintain production
- Reduction in equipment plugging leading to reduced non-productive tie
- Reduction in produced water treatment problems
- Less oil-in-water carryover.
- Environmentally safe wastewater disposal
- Lower pumping pressures due to reduced fluid viscosity

We can provide the expertise in designing treatment tests to meet a client's particular asphaltene-wax-scale challenges. The testing program is tailored to the specific issues presented and the laboratory testing is performed to evaluate all potential solutions that can achieve the desired results.

As an alternative, we also offer tests on low-dosage hydrate inhibitors since these often can be demonstrated to be a more cost-effective and environmentally acceptable solution for solids deposition problems.

As a service provider, we make a continuing effort to meet the increasing and exacting needs of the Upstream Industry. We continue to develop new methods and test procedures and are always available to learn of any new requirements so that we can serve from first-oil to end-of-field-life.

SARA Analysis - TOL 5051

SARA analysis (Test Code TOL 5051), uses high performance liquid chromatography (HPLC) to test a fluid for:

- Saturates
- Aromatics
- Resins
- Asphaltenes

A test package for SARA analysis is available. Request Test Code TOL 5051.

Compositional Analysis: Oil, Gas Condensate, and Brines

Texas OilTech Laboratories offers a wide selection of analytical testing services including:

- Crude Assay Services
- Crude Fractionation and Studies
- Heavy Metals and Corrosion Analysis
- Natural Gas Analysis
- Cation and Anion Analysis
- Total Solids (TS)
- Total Dissolved Solids (TDS)
- Organic Acid

CRUDE OIL

Our Texas Laboratories are on the west side of Houston, between many of Texas crude oil gathering points and the local refineries. Crude oil characterization identifies the useful distillate ranges in the product in addition to some the less desirable components. Once a site is characterized, it may only be necessary to conduct a few quality control tests on each truck-load to assure the product uniformity.

Crude Oil Characterization

Test Code	Description
ASTM D 5002	Density and Relative Density of Crude Oils by Digital Density Analyzer
ASTM D 4007	Water and Sediment in Crude Oil, BS&W
ASTM D 4006	Water by Distillation, Crude Oil
ASTM D 4807	Sediment in Crude Oil by Membrane Filtration Test
ASTM D 5853	Pour Point of Crude Oils
ASTM D 3230	Salt Content of Crude Oil, Electrometric Method
ASTM D 4929	Chlorides, Organic, in Crude Oil (Naphtha Cut)
ASTM D 4294	Sulfur by X-Ray Fluorescence Spectroscopy. LOD = 0.01 wt%
ASTM D 6377	Vapor Pressure in Crude Oil, Expansion Method
TOL 5051	SARA, Saturates, Aromatics, Resins and Asphaltenes Analysis

	Additional Tests
ASTM D 5307	Boiling Range Distribution of Crude Petroleum, by GC
ASTM D 4377	Water in Crude Oils by Potentiometric Karl Fischer Titration
UOP 79	Fractionation of Petroleum Distillates
BMCI	Crude Oil Classification, Bureau of Mines Index
TOL 5048	Crude Oil Classification, Paraffinic or Asphaltinic
ASTM D 2892	True Boiling Point and Distillation of Crude Petroleum (15 Theoretical Plates)
ASTM D 7455	Sample Preparation of Petroleum and Lubricant Products for Elemental Analysis
ASTM D 5708	Nickel, Vanadium, and Iron in Crude Oils and Residual Fuels by Inductively Coupled Plasma - Atomic Emission Spectrometry (ICP-AES)

Crude Oil Quality Control

Test Code	Description
ASTM D 287.a	API Gravity, Hydrometer Method
ASTM D 4006	Water by Distillation, Crude Oil
ASTM D 473	Sediment by Extraction
ASTM D 4294	Sulfur by X-Ray Fluorescence Spectroscopy. LOD = 0.01 wt%

Note: Quality Control tests for Texas Crude Oils can be provided on a two hour turn-around time in our Houston laboratory when required.

CRUDE OIL

Crude Oil Full Assay

Test Code	Description
ASTM D 2892	True Boiling Point and Distillation of Crude Petroleum
ASTM D 5236	Distillation of Heavy Hydrocarbon Mixtures (Vacuum Potstill Method)
ASTM D 1298	Specific Gravity at 60°F and 100°F
ASTM D 1298.a	Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
UOP 375	UOP Characterization Factor and Estimator Molecular Weight, Calculated
ASTM D 445	Viscosity, Kinematic, at 100°F, cSt
ASTM D 445	Viscosity, Kinematic, at any other Temperature
ASTM D 445	Viscosity, Kinematic, at 210°F, cSt
ASTM D 323	Vapor Pressure of Petroleum Products, Reid Method
ASTM D 2622	Sulfur, X-Ray Spectrometry. LOD = 0.001 wt%
UOP 163	Hydrogen Sulfide and Mercaptan Sulfur in Petroleum Products
ASTM D 2699	Octane Number, Research (Addition)
ASTM D 2700	Octane Number, Motor Method
ASTM D 1159	Bromine Number by Electrometric Titration Method
ASTM D 2163	Composition of Liquid Petroleum (LP) Gas and Propane by GC
ASTM D 6730	PIONA Analysis of Gas Chromatography
ASTM D 1840	Naphthalene Content in Aviation Turbine Fuels
ASTM D 6591	Aromatic Hydrogen Types in Middle Distillates, High Performance Liquid Chromatography (HPLC) Method with Refractive Index Detection
IP 469	Saturated, Aromatic and Polar compounds by Thin Layer Chromatography, GC-FID
ASTM D 664	Acid Number of Petroleum Products, Potentiometric Titration
ASTM D 3230	Salt Content of Crude Oil, Electrometric Method
ASTM D 4929	Chlorides, Organic, in Crude Oil (Naphtha Cut)
ASTM D 5762	Nitrogen in Petroleum and Petroleum Products
UOP 313	Nitrogen Content
ASTM D 56	Flash Point, Tag Closed Tester
ASTM D 92	Methods for Testing Tall Oils – Flash Point ASTM D 92 or ASTM D 93
ASTM D 93	Flash Point Pensky Marten Closed Cup
ASTM D 1322	Smoke Point of Kerosene and Aviation Turbine Fuels
ASTM D 5853	Pour Point of Crude Oils
ASTM D 2386	Freezing Point of Aviation Fuels
ASTM D 4006	Water by Distillation, Crude Oil
ASTM D 4007	Water and Sediment in Crude Oil, BS&W
ASTM D 473	Sediment by Extraction
ASTM D 6560	Asphaltenes (Heptane Insolubles) in Crude Petroleum and Petroleum
ASTM D 4530	Carbon Residue (Micro Method)
ASTM D 5708 B	Nickel, Vanadium, and Iron in Crude Oils and Residual Fuels by Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP-AES)
ASTM D 2887	Distillation True Boiling Point
ASTM D 86	Distillation of Petroleum Products at Atmospheric Pressure
ASTM D 1160	Distillation of Petroleum Products at Reduced Pressures, at 5 and 10mm

ANALYSIS OF BRINES & DRILLING MUDS

Produced Water Analysis

Test Code	Description
ASTM D 1976	Metals in Water or Aqueous Matrices by ICP-AES
ASTM D 4327.a	Anions in Water by Chemically Suppressed Ion Chromatography
TOL 6055	Organic Acids in Wastewater Using Ion-Exclusion Chromatography and On-Line Carbonate Removal
Std M 2540D	Total Suspended Solids, TSS
Std M 2540C	Total Dissolved Solids, TDS
ASTM D 1125	Electrical Conductivity and Resistivity of Water
Std M 5310B	Total Organic Carbon (TOC)
ASTM D 1067	Acidity or Alkalinity of Water
ASTM E 70	pH of Aqueous Solutions with Glass Electrode

Drilling Fluids Analysis

Test Code	Description
API 13B-2	API Recommended Practice for Field Testing Oil-Based Drilling Fluids - Mud Balance - Rheometers - Sand Content - API Filtration Test - HTHP Filtration Test
ASTM D 4959	Moisture Content by Direct Heating Method
API RP 13B-1	Resistivity Meter

Note: Other test methods are available for Drilling Fluids Analysis. You may request a quote to meet your Drilling Fluids specification.

ELEMENTAL ANALYSIS (TRACE METALS)

Texas OilTech Laboratories provides a sophisticated and well-equipped commercial facilities for the determination of low concentrations of elements in aqueous and hydrocarbon products. Typical applications include: lubricants, process water and wastewaters, crude oils, natural gas, and other fuel gases, fuel oils, diesel fuel, an assortment of bio fuels, and many refined oil products.

Applications for Elemental Analysis

Elemental Analysis is used to assess the condition of lubricating oil that has been formulated with defined quantities of additives that provide anti-wear, oxidation stability, or water resistance properties to the lubricant. So, elemental analysis (or trace metals analysis) is used to simultaneously monitor disappearance of the desirable additive metals along with the appearance of any undesirable wear metals. This assures that the lubricant can continue to function as intended.

In fuels analysis, the trace metals refer both to those elements present as metallic compounds in solution and to metals present in particles such as rust. They can be dissolved or suspended in the fuel hydrocarbons or in free water present in the fuel. When trace metals are maintained at lower levels in a liquid or gaseous fuel at a power plant, then longer, corrosion-free service can be expected.

Environmental regulations dictate the measurement of discharge waters, sediments, sludges, and stack gases in many plant processes.

Analytical Techniques for Trace Metals

The term, trace, does not imply a single concentration of the element and there is no single definition for “trace”. A trace amount will vary according to the nature of the product and to the required specification for a particular product. For example, what is considered an allowable amount in a turbine fuel may be quite different from a trace in a coal or a Refuse Derived Fuel (RDF)?

Texas OilTech Laboratories offers tests for elemental analysis by several analytical techniques that are designed to detect concentrations of parts per million (ppm), or even less. These various procedures provide different Limits of Detection or LOD. The exact LOD will depend on each sample matrix and the specific element.

The concentrations reported in elemental analysis can be expressed in several ways. The unit of parts per million by weight, or ppm, is perhaps the most common. Some alternate expressions are shown in Table 1.

Analytical techniques vary according to the instrumental procedure and also for individual elements. As a guideline, we state the Limit of Detection, or LOD, for an average element for a given instrument.

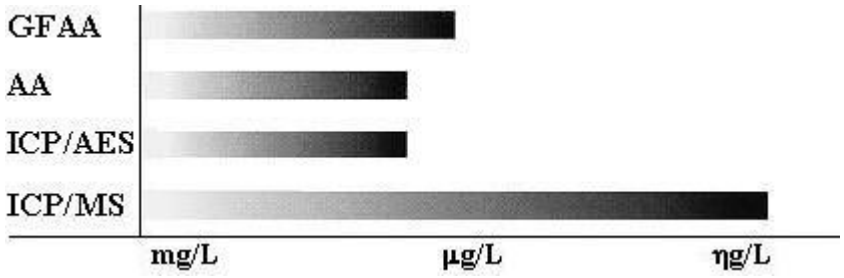
The various techniques we use are generally as follows:

- Spectrochemical Analysis, 21 elements, LOD = 5 ppm (parts per million, weight basis)
- Inductively Coupled Plasma, ICP, 60 elements, LOD = 1 ppm
- Metals by Graphite Furnace Atomic Absorption, GFAA, LOD = 0.5 ppm
- Metals by Atomic Absorption and Flame Emission Spectrometry, LOD = 0.1 ppm
- Trace Elements by Inductively Coupled Plasma - Mass Spectrometer, LOD = 0.001 ppm

Table 1.
Limit of Detection (LOD)

Units of Measurement	LOD
ug/mL	ppm
ug/g	ppm
mg/L	ppm
ug/L	ppb
ug/kg	ppb

Figure 1.
Typical Detection Limits for Analytical Techniques



ELEMENTAL ANALYSIS (TRACE METALS)

The Limit of Detection for trace metals by ICP/MS, LOD = 0.001 ppm, is therefore about 1 part per billion or 1 ug/L The range of this instrument continues to improve so that it is now possible to detect some elements with LOD of fractional parts per billion, and even, at times, approaching parts per trillion. Analytical techniques used for Elemental Analysis are shown in Table 2 and in Figure 1.

Table 2.
Analytical Techniques for Elemental Analysis (Trace Metals)

1.AAS	Atomic Absorption Spectroscopy, LOD = 0.1 ppm
2.FAAS	Flame Atomic Absorption Spectrometry
3.GFAAS	Graphite Furnace Atomic Absorption Spectrometry, LOD = 0.05 ppm (typically)
4.CVAA	Cold Vapor Atomic Absorption (for Mercury)
5.ICP-AES	Inductively Coupled Plasma/Atomic Emission Spectrometry, LOD = 0.05 ppm
6.ICP-MS	Inductively Coupled Plasma/Mass Spectrometry, LOD = 0.001 ppm or <1 ppb
7.XRF	X-Ray Fluorescence Spectroscopy
8.EDXPF	Energy-Dispersive X-Ray Fluorescence Spectroscopy
9.WDXRF	Wavelength Dispersive X-Ray Fluorescence Spectroscopy
10.RDE	Spectrochemical Analysis, 21 Elements, LOD = 5 ppm

Testing Packages for Trace Metals and Elemental Analysis
In certain cases, and especially when the concentration range for contaminants is unknown, a testing package can be provided. It is necessary to first do some type of semi-quantitative scans so that the elements present and their relative concentrations can be estimated. This prevents damage to an instrument by saturating a sensor. Once the range of each element has been identified, a second test is conducted to quantify the contaminants or trace elements, using either the same instrument with appropriate sample dilution, or, perhaps another instrument that offers lower limits of detection.

We use ASTM and Manufacturers' Specifications as guidelines in Elemental Analysis. It is sometimes possible to offer a more cost-effective alternative for the same LOD, or to offer another method having better detection limits for the same cost. We advise our clients when ASTM test procedures are modified or upgraded and we are always happy to discuss your specific requirements.

ASTM D 7111 is widely used for elemental analysis and for trace metals. Texas OilTech Laboratories instruments are capable of detecting over fifty elements down to a Limit of Detection (LOD) of about 0.05 ppm (50 ppb).

Various sets of elements can be found among the test packages for liquid and gaseous fuels, as specified by various manufacturers. A general discount schedule applies, based on the number of elements in the set. According to the following schedule.

Test Code	Description
ASTM D 7111.1	One element, specify
ASTM D 7111.2	Two elements, specify
ASTM D 7111.3	Three elements, specify
ASTM D 7111.4	Four elements, specify
ASTM D 7111.5	Five elements, specify
ASTM D 7111.6	Six elements, specify
ASTM D 7111.7	Seven elements, specify
ASTM D 7111.8	Eight elements, specify
ASTM D 7111.9	Over eight elements

Other charges for sample preparation may apply for elemental analysis and trace metals, depending on the test matrix.

ENVIRONMENTAL ANALYSIS

Used Oil Burned for Energy Recovery, 40 CFR, 266.40
BIF Fuels, Used Oil Fuels

Test Code	Description
EPA 1010	Ignitability, Flash Point, Pensky-Martens (PMCC)
EPA 9020B	Halogens, Total Organic (TOX)
EPA 3050B	Sample Preparation, Sediments, Soils, Sludges, Acid Digestion
EPA 6010B.1	Metals by Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP-AES), on Soils, Sludge, Solids, and Petroleum Products. Includes: Arsenic, Cadmium, Chromium, and Lead. Limit of Detection. LOD = 1 ppm

Additional Tests

ASTM D 482	Ash Content of Petroleum Products
ASTM D 445.a	Viscosity, Kinematic, at 40°C, cSt
ASTM D 240	Heat of Combustion, by Bomb Calorimeter
EPA 7470A	Mercury, by Cold Vapor Atomic Absorption, Liquid Waste
EPA 8080A	PCBs in Soil by Extraction and Gas Chromatography

Hazardous Waste Characterization (RCRA)
Toxicity Characteristic Leaching Procedure (TCLP)
RCRA Metals, Solid Samples, Soils, and Sludges

Test Code	Description
EPA 3050B	Sample Preparation, Sediments, Soils, Sludges, Acid Digestion
EPA 6010C	TCLP Metals by ICP - AES. Includes: Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver, mg/L LOD =1 ppm
EPA 245.1	Mercury by Cold Vapor Atomic Absorption, LOD = 0.05 ppm

Drilling Fluids (Muds)
Crude Oil Contamination

Test Code	Description
EPA Appendix C	Crude Oil Contamination in Non-Aqueous Drilling Fluids by GC-MS

Test Codes are for identification and are generally related to the ASTM or other protocol. We use suffix letters with the test codes to identify different practices within the same ASTM procedure, e.g., different test temperatures, or different test times.

SIMULATED DISTILLATION BY GAS CHROMATOGRAPHY

Simulated distillation analysis, or Sim-Dis, is a process that used to simulate the actual physical distillation of petroleum products by Gas Chromatography. There are several ASTM test methods that are referred to as Sim-Dis, and these differ from one another as to the type of hydrocarbon product and the temperature range of interest. However, in each method, the non-polar and low polar hydrocarbons are eluted from a gas chromatograph column in a specific boiling point order.

A program of increasing temperature is applied to a GC column and the time axis is converted to temperature by running a calibration standard under the same conditions as the sample, so that the retention times of hydrocarbons are related to their respective boiling points.

Simulated Distillation or Sim-Dis is alternately known as Boiling Range Distribution or Composition Breakdown. The ASTM has at least four approved test procedures for Sim-Dis. These are intended to replace the traditional physical distillation methods such as ASTM D 86 and ASTM D 2892. In fact, ASTM work groups now give consideration to including Sim-Dis as a specification test for such products as diesel fuel, kerosene, jet fuel, fuel oil, and biofuels.

Simulated Distillation Methods:

Texas OilTech Laboratories offers several tests for Sim-Dis and related procedures that are based on the recognized ASTM methods. The temperature range has been extended in several of these tests by applying Sim-Dis procedures.

Simulated Distillation Methods

Test Code	Description
ASTM D 2887.c	Simulated Distillation, SimDis, Lower Temperature Range, 55 to 538°C, C_5 to C_{44}
ASTM D 2887.d	Simulated Distillation, SimDis, High Temperature Range, 360 to 575°C, C_{10} to C_{50}
ASTM D 2887.a	Boiling Range Distribution of Petroleum Fraction by Gas Chromatography
ASTM D 2887.b	Composition Breakdown (C_1 to C_{40}) by GC, Sludge
ASTM D 3710	Boiling Range Distribution, Gasoline, by GC
ASTM D 5307	Boiling Range Distribution of Crude Petroleum, by GC
ASTM D 6352	Boiling Range Distribution of Petroleum Distillates in Boiling Range from 174 to 720°C by Gas Chromatography, C_{10} to C_{100}
ASTM D 5442	Petroleum Waxes by Gas Chromatography

In addition, other Gas Chromatography procedures can be modified to include the principles of Simulated Distillation for a variety of other petroleum products. It has become an important tool in the investigative work that we perform for clients. Please contact Texas OilTech Laboratories to request information regarding Simulated Distillation procedures that can be applied to your product

ON-SITE ANALYTICAL TESTING SERVICES

On-site testing of fuels and lubricants is the most cost-effective way to provide project engineers and managers with critical, reliable data at power plant construction projects. Results of fuel analysis are available in a matter of hours rather than days so that immediate measures can then be taken in regard to the fuel, the turbines, or to the combustion parameters.

This is also true any time an installation is being serviced, or is undergoing performance testing, or plant commissioning, or at any other time when a large number of personnel are gathered at the plant site. Then it always makes sense to minimize the total number of man-hours on the job site.

There are many other situations when it is practical to call for on-site testing of liquid or gaseous fuels such as pipeline quality issues or at offshore production platforms, or compressor stations, or when the parameters must be defined for dewatering or condensate removal from the raw gas.

Texas OilTech Laboratories is an ISO accredited facility under ISO 9001:2008 and ISO/IEC-17025, and this accreditation also extends to our on-site testing capabilities. We have participated in the completion of several hundred power plant projects and dozens of off-shore plant sites in the USA and around the planet. We have the capacity to simultaneously support multiple on-site teams in the field.

Industries Served:

- Independent Power Producers
- Municipal Utilities
- Petroleum Refineries
- Turbine Manufacturers
- Petrochemical Plants
- Engineering and Construction Firms
- Off-shore Production Platforms
- Engineering Consultants

On-Site Testing Services:

- Power Plants and Electric Energy Generation
- Gas Turbine Performance Testing
- Plant Commissioning Testing
- Gas and Liquid Fuel Quality Control Analysis

Benefits:

- High-speed, on-site analysis
- Eliminate sample shipping hassles and costs
- Increased team productivity
- Increased flow of information with timely data
- Fully trained instrumentation chemist on site
- On-site assistance in data interpretation

ON-SITE ANALYTICAL TESTING SERVICES

What Analytical Procedures Are Available On-Site?

Sample Fuel Cylinders and Documentation:
Fuel sample containers are available for both domestic and offshore projects. Gas sample cylinders, one-liter opaque glass bottles, labels, and forms are provided at no cost (shipping charges are invoiced).

Portable GC Quad Detector:
Portable gas chromatographs (GC) are available on-site testing for the extended ASTM D 1945 gas analysis. They contain four independently controlled GC Modules, each designed to determine specific constituent levels present in a gas sample. We have completed multiple studies comparing the precision of on-site testing vs. in-laboratory testing by using retain or duplicate samples. A report is available on our web site or by contacting our office.

Patented Assembly for Determination of Particulates in Gaseous Fuels:
Many gas turbine manufacturers now require quantification of particulates in gaseous fuel streams, both in terms of their particle sizing/count and in the elemental identification of those particles, especially for Sodium, Potassium, Vanadium, and Silica,

On-Site Gas Moisture Analyzer:
Our field staff can provide real-time moisture-in-gas analysis at your plant sites thus eliminating the need to ship large gas cylinders to laboratories for moisture analysis.

Portable Spectrochemical Analyzer for Trace Metals:
Using ASTM D 6595 and a state-of-the-art RDE instrument specifically designed for determination of trace elements in liquid fuels, we can provide maximum sensitivity, lowest levels of detection, and highest degree of accuracy for on-site analysis of trace metals.

Other On-site Tests:
Many other analytical instruments can be brought to your job site. We recommend that you contact our technical personnel to discuss your specific requirements. We will always strive to provide you with the most cost-effective on-site testing program for your products.