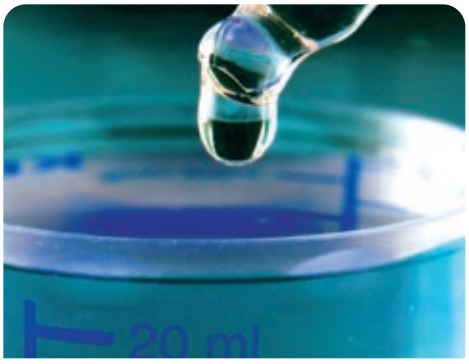
ANALYSTS, INC.



ASTM Testing Provides Vital Mechanical And Quality Insight

Analysts, Inc., offers a full range of ASTM and other specialized testing and analysis.

At each of the company's five regional laboratories, senior chemists spearhead Analysts' ASTM services. Each lab section is managed by Ph.D., M.S. or bachelor-degree chemists. Stringent quality assurance and ISO 17025 certification contribute to open discourse between these tribologists, data analysts and Analysts' field service engineers.

ASTM-testing procedures are routinely included in the analysis programs performed by Analysts for new and used lubricants, distillate fuels, coolants and refrigerants. Each lab offers a full range of specific and complete ASTM and other procedural testing services for:

- Fuels
- Metal-Working Fluids
- Waste Oils
- Refrigerants
- Greases and Wire Lubricants
- Deposits and Filter Contents
- Component-Failure Analysis

You can order any of thousands of ASTM procedures for specific situations and analysis. The following describes some of the more common tests currently conducted for our customers.

Special Tests for Fuels

To help insure the quality of fuel, Analysts performs ASTM testing for cetane index, sulfur concentration, aromatic concentration, oxidation stability, flash point, microorganisms, sediment and water concentration. These tests are included in Analysis' fuel-analysis programs.

Some of the other typical ASTM tests for fuel include:

- Distillation (volatility) characteristics, ASTM D86
- Flash Point, ASTM D93
- Cloud Point, ASTM D2500
- API Gravity ASTM D287
- Sulfur Content by X-Ray
- Fluorspectroscopy ASTM D4294
- Fuel by Distillation, ASTM D322

Special Tests for Lubricants

A variety of ASTM tests for specific lubricants are available.

These include ASTM D2272 Rotating Bomb Oxidation, ASTM D2274 Oxidation Stability, ASTM D3223 Nitrogen Content for turbine oils, and Dissolved-Gas Analysis under ASTM D3612 for transformer oils.

Additional lubricant testing capabilities include:

- Cold Crank Simulation ASTM D5293 to measure the viscosity of an oil at low temperatures -5 to -30 degrees C.
- Inductively Couples Plasma Atomic Emission Spectrometry (ICP-AES) ASTM D4951 and D5185.
- Organic Halogens ASTM D4929/ EPA 9076 determine the chlorine content in crude oil, chlorinated paraffins, engine oil, aqueous samples and solids.

If a contaminant is present in a sample, infrared reference analysis can be used to identify its source. In contaminant identification FTIR procedures, it is possible to determine not only the source, but the concentration of the contaminant.

ASTM TESTING

ASTM Tests for Refrigerants

Basic testing for compressor lubricants includes spectorochemical analysis and physical properties tests for viscosity, acidity and moisture. Refrigerant and compressor lubricant services are useful in equipment surveys, in preventive maintenance programs, and for system conversions to R134A refrigerants. Several of these tests help ensure warranty coverage.

As lubricants begin to degrade from normal operations, other testing pinpoints specific conditions and remedies. The following may be recommended by your data analyst or optionally purchased.

- Dielectric Breakdown, D877 measures the lubricant's current ability to withstand voltage without conductance.
- Filter-content analysis allows monitoring for larger wear and corrosion materials.
- Chloride-content tests (D512 and others) ensure that oxidation and hydrolysis — particularly susceptible from fluorocarbons — are not developing as strong acids.
- Color comparisons in ASTM D1500, D1544 and D156 can show the levels and effects of oxidation.
- R134A-conversion analysis ensures sufficient mineral-oil content has been purged from the system for successful operation.

Analysts also provides testing to insure that your current refrigerant solutions are free of moisture and other contaminants. Special sampling cylinders can be purchased or leased for this critical maintenance activity.

ASTM Tests for Greases

Analysts also offers complete ASTM analysis of grease to monitor contamination levels, degradation characteristics and wear rates. Analysis of greases differ from the testing procedures for lubricating oil.

Analysts is one of a select few testing organizations capable of measuring elements in absolute values.

Most labs can measure relative values. Absolute values require a more complex method of dilutions and acid digestion. Absolute values provide a more definitive evaluation of wear rates and physical properties. Grease samples can be submitted on a one-time basis for evaluation of specific problems or routinely over time to monitor trends.

A few of the more critical tests are:

- Depending on your application, Analysts will perform full-scale cone-penetration testing ASTM D217 or quarter-scale penetration ASTM D1403. This testing verifies the compatibility of greases and the quality of new greases.
- Dropping point ASTM D2265 measures the temperature at which oil separates or "drops" from the grease.
- Infrared analysis identifies contaminants and additive levels present in greases and confirms the types of grease in use. It is a powerful tool in diagnosing grease related problems.

Measuring the concentration, metallurgy and characteristics of wear metals in used grease indicates how much wear is taking place, its sources and causes.

For example, deleterious-particles testing ASTM D1404 detects and quantifies particles contained in a lubricating grease. This procedure provides a standard means to monitor the level of particles contained in grease. Deleterious particles can be present in a new grease as a contaminant that may have been introduced in production, shipment or storage. Such particles may also be present as a result of wear of contaminants during operation.

Call for Details

Contact an Analysts representative at one of our regional laboratories to learn more about these and other special ASTM tests and proper sampling procedures.
Or visit us at www.analystsinc.com.

LOS ANGELES, CA	800-424-0099
HOUSTON, TX	800-248-7778
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ATLANTA, GA	800-241-6315
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