

BETA LABORATORY
FOR RESULTS
YOU CAN TRUST.



COMPETITIVE PRICING
+QUALITY
+ON-TIME DELIVERY
=CUSTOMER SATISFACTION

BETA

FirstEnergy

Staying competitive is never an easy task. Companies like yours are seeing tighter budgets, reduced staffing and stricter quality standards and customer specifications. On top of that, you often have to deal with ever-increasing regulatory requirements.

With all these cost-cutting measures, how do you make sure your company continues to perform better than all the others while keeping within your budget limitations?

Look to BETA Lab to implement the most cost-effective testing, calibration and safety and health programs.

Then leave the details to us.

BETA

BETA LAB – THE BIG PICTURE

BETA Laboratory is a premiere provider of analytical, technical and Safety and Health training services with clients ranging from legal firms to insurance companies, small firms to Fortune 500 companies as well as international corporations. We provide solutions to a wide range of industries including manufacturing, aerospace, nuclear, governmental and health-care.

Our leading team of scientists, engineers, analysts and technicians continually demonstrate our well-earned reputation for timely and accurate results. We achieve reliable results by adhering to rigid quality control procedures, investing in the most innovative equipment and using proven techniques.

Working with BETA Laboratory, you will be able to tap into any one or all of our extensive calibration, analytical testing and safety and health capabilities – conveniently located under one roof. You'll gain peace of mind knowing that your testing, calibration and safety programs are being expertly managed without over-extending your workforce and resources.



PARTNER WITH BETA LAB “The One-Source Solution for All Your Calibration, Analytical Testing and Safety and Health Training Needs.”

- **The variety of BETA’s Calibration Capabilities clearly sets us apart from other labs. Our highly qualified staff provides time- and money-saving solutions for all your calibration needs. BETA’s full service calibration program is ISO 9001 registered and ISO/IEC 17025 (Per Scope) accredited. Our laboratory standards are traceable to the National Institute of Standards and Technology (NIST).**
- **We are an ISO 9001 Registered Laboratory that provides Analytical testing of lubricating oil, grease, metals, gases, fuels, water, transformer fluid, PCBs, asbestos unique chemical analysis ... and much more.**
- **The Safety and Health Services that BETA provides includes safety and compliance audits, program development, regulatory training, OSHA 10-Hour and 30-Hour courses (General Industry & Construction) and Fire Simulator Training.**



BETA LABORATORY – OIL TESTING

Lube Oil Analysis

Our Oil Lab can provide a wide range of testing capabilities to support your predictive maintenance program. Oil analysis provides key information concerning the condition of equipment. Having your oil tested at BETA Lab means you will get clear, accurate results that meet ASTM testing guidelines and our own stringent quality control measures.

Two of our most requested packages are:

Lube Oil Package 1 – Recommended for Gearbox and Diesel Engines

Analysis	Method
• Metals Analysis	Spectrographic Analysis - ASTM 6595
• Wear Particle Count	Ferrogaphy–Direct read
• Viscosity	ASTM D445
• Neutralization Number	ASTM D664

Lube Oil Package 2 – Recommended for Pumps, Compressors, Hydraulics and Turbines

Analysis	Method
• Metals Analysis	Spectrographic Analysis - ASTM 6595
• Particle Count	ASTM F661
• Viscosity	ASTM D445
• Neutralization Number	ASTM D664
• Karl Fischer – Moisture Analysis	ASTM D1744

Fuel Oil Analysis – (Most Commonly Requested)

Analysis	Method
• Copper Corrosion	ASTM D130
• Distillation	ASTM D86
• Cetane Number	ASTM D976
• Micro Carbon Residue	ASTM D4530
• Sulfur	ASTM D4294
• Ash Content	ASTM D482

Oil Analysis:

- Provides key information about the condition of equipment
- Detects problems before serious equipment failure and costly, unscheduled downtime occurs
- Determines whether lubricating oils need to be changed – eliminating premature change-outs and reducing disposal costs
- Determines if used oil is still an adequate lubricant by evaluating it against virgin oil
- Identifies contamination, additive content and degradation of a lubricant
- Analyzes metal particles to detect the condition of the oil and the machine's lubricated (wearing) parts

Insulating Oil Analysis

Oil Quality includes the following:

- Interfacial Tension (IFT) - ASTM D2285
- Dielectric Strength - ASTM D877
- Moisture Analysis - Karl Fischer/ASTM D6304
- Neutralization Number (NN) - ASTM D664
- Specific Gravity - ASTM D1296
- Visual, Sediment, Color - ASTM D152
- PCB Content - ASTM D4059

Dissolved Gas Analysis (GC) - ASTM D3612 Method C

Nine dissolved gases in oil plus:

- PPM of each gas
- Historical data
- Total combustibles
- Total gas
- Recommendation

Results

- Data Sheet with interpretation and recommendation
- Available with a standard 5-8 working day turn-around time
- **Available in as soon as 2 hours in critical situations**
- Available by phone, fax, electronic file or hard copy

Oil Quality Testing:

Transformer and circuit breaker insulating oils are tested to determine their appropriateness for service and to establish trends in oil degradation.

Dissolved Gas Analysis:

Oil Dissolved Gas Analysis (DGA) is a key method to detect signs of incipient faults and earlier failure or degradation of dielectric materials used in HV equipment. A range of gases may be detected, the presence of which might indicate a range of malfunction conditions within the equipment.

PCB Testing:

Gas chromatography is used to determine the presence of any toxic PCBs in oil or other materials.

Additional Oil Test:

RPVOT testing artificially ages the oil to give an indication of the remaining oil life or to compare the relative expected life of new oils.

Used Oil Screen:

BTU, Sulfur, PCB, Total Halogens, Flash Point and Metals

Other Testing:

Filter Examination, Filter Preparation

Grease Testing:

Dropping Point, Cone Penetration



SAFETY AND HEALTH SERVICES

Overseeing your safety procedures and training programs can be time consuming – but these disciplines are vital to your employees' health and your company's success. With OSHA-mandated regulations demanding more of your time and money, let BETA Lab assist you in reaching your safety and health goals.

Our extensive resources can enhance your safety and health programs as well as improve productivity and employee morale.

Your time is valuable, and we can help. Listed below are just some of the capabilities our Certified Safety Professionals provide:

OSHA Compliance Training

- OSHA 10-Hour and 30-Hour Courses (General Industry and Construction)
- Permit Required Confined Spaces
- Hazard Communication
- Asbestos Awareness
- Personal Protective Equipment
- Lockout Tagout
- Electrical Safety
- Fall Protection
- Bloodborne Pathogens
- Respiratory Protection

Safety Services

- Air and Noise Monitoring
- Job Hazard Analysis
- Safety and Compliance Audits
- Program Development

Fire Training Services

Our fire training services features the zero emission portable extinguisher training unit that is ideal for use at "clean" industries, hospitals, and schools as well as anywhere basic fire extinguisher training is required. The unit operates using computer controlled sequencing along with laser and compressed air fed through an actual portable extinguisher, so scenarios can be altered to adjust the type of fuel, flame intensity and the difficulty in extinguishing the fire.

Plus, training on the simulator can be done in a classroom or any reasonable sized room where the light level can be controlled.

Fire Simulator Benefits:

Flexible Scheduling

No delays due to rain, snow, wind or EPA ozone action days

Time Savings

Training can be conducted at customer locations in single or multiple sessions

Reduced Costs

No expense for permits, dry chemical, extinguishers, gasoline or kerosene

Environmentally Friendly

No pollution or smoke caused by live fires

Simulator Details

Meets OSHA's standard 1910.157 (g) for hands-on training

Simulates five types of fires

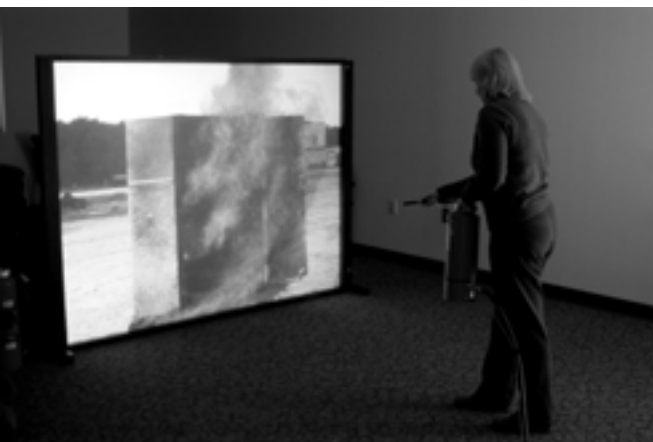
- Spill fire
- Gravity fire
- Liquid in-depth fire
- Flammable storage cabinet

METALLURGICAL SERVICES

Each year clients from all over the United States rely on the expertise of BETA's Metallurgical and Failure Analysis Laboratory. The widespread customer base includes the automotive industry, utilities, insurance companies and a variety of manufacturing companies. Many of the services provided have assisted in the areas of material selection, fabrication, failure analysis, condition assessment and material identification. Our engineers and technicians on staff possess a great deal of knowledge and experience – a number of them with over 25 years of industry experience each.

Capabilities Include:

- Macro and Microscopic Elemental Analysis of Materials, Corrosion/Combustion Layers using SEM/EDS
- Consulting Services in the Area of Materials Engineering
- Chemical Analysis by Optical Emission Spectroscopy, Inductive Coupled Plasma
- Material Failure Analysis and Fracture Characterization using Scanning Electron Microscope
- Evaluation of Remaining Useful Life of Waterwall tubes, Superheater tubes and High Energy Piping
- Boiler Tube and Turbine Blade Deposit Index and Chemical Analysis
- Optical Microscopy
- Materials Testing for a wide variety of Materials, and Environments
- Field Chemical Analysis, Replication and Hardness Testing
- Image Analysis
- Macro and Micro Hardness Testing
- Welding Procedure Development, Qualification and Failure Analysis



The training method of today, and the future!

MATERIAL TESTING AND ANALYSIS

Capabilities Include:

- Analyzing *physical* and *chemical* properties of organic and inorganic materials to provide useful information for the identification of contaminants and unknowns
- Material verification and confirmation
- Material performance and suitability
- Investigative failure analysis and chemical decomposition/degradation
- Asbestos Identification
- Tensile testing, hardness, dielectric breakdown
- Accelerated aging of materials – coatings, polymers, elastomers and textiles

Nuclear and Commercial Dedication Testing of:

- Materials – elastomer gaskets, O-rings, seals, metals
- Electrical Components – fuses, resistors, switches, motors, relays, light bulbs
- Products – compositional analysis for contaminants, halogens, oxidation

WATER SAMPLING AND ANALYSIS

Capabilities Include:

- Laboratory Analyses of samples from groundwater/wells, storm water, NPDES, permit renewal, material analysis
- Sample Preparations by using techniques of Open Vessel Digestion, Auto-Fluxer, Oxygen Bomb, Acid Digestion
- Anions by Ion Chromatography
- ICPs for metal analysis
- Low level sodium analysis on a Bulk Flame Photometer
- Lead in paint analysis
- Oil and Grease by EPA Method 1664A using Hexane
- TOC analysis
- TCLP/EPTOX sample preparations and analysis
- RCRA analysis
- Gravimetric Analyses such as Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Total Solids (TS)
- Colormetric analyses
- Other assorted analyses include pH, conductivity, ammonia, COD, water hardness, hexavalent chromium, cold vapor mercury, nitrates and alkalinity/acidity



MEASURING AND TEST EQUIPMENT CALIBRATION

At BETA Lab, we are continually investing in the most sophisticated equipment available. That is why customers across all industries rely on us for their calibration needs. Our full-service calibration programs meet industry standards, including IEEE 498, ANSI Z540, ISO 9001:2000, ISO/IEC 17025 (Per Scope) and Nuclear 10CFR50, Appendix B and Part 21.

Take a look at the services we provide:

Electronic and Electrical Calibrations

- Multimeters/Process calibrators
- Decade boxes/Resistors
- Recorders
- Oscilloscopes
- Frequency counters
- Current, frequency and voltage devices

Torque Calibrations

- Torque wrenches
- Torque multipliers
- Hydraulic torque wrenches
- Special calibrations for motor and air operated valve diagnostic equipment
- Calibration ranges up to 20,000 ft-lbs

Pressure Calibrations

- Gauges
- Transducers
- Calibrators
- Barometers
- Vacuum and absolute pressure capabilities

Gas Flow Calibrations

- Mass flow transducers
- Rotameters

Temperature and Humidity Calibrations

- Thermometers and temperature sensors
- Recorders
- Hygrometers
- Environmental testing

Vibration Calibrations

- Vibration instrumentation calibrations
- Accelerometers
- Velocity sensors
- Analyzers
- Seismic monitoring equipment

Dimensional Calibrations

- Micrometers
- Calipers
- Dial indicators
- Hardness testers
- Wire terminal crimpers



BETA LAB – AT A GLANCE

BETA Laboratory is part of FirstEnergy Corp., a diversified energy services company. FirstEnergy Corp. is a registered public utility holding company headquartered in Akron, Ohio. With combined assets of \$34 billion, its various subsidiaries produce annual revenues of more than \$12 billion.

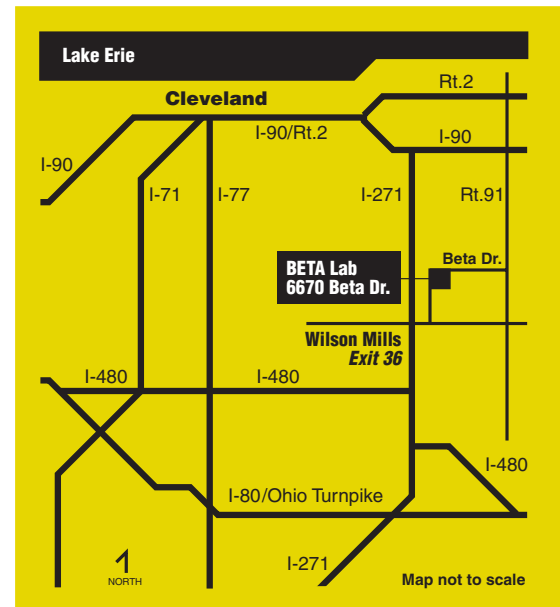
FirstEnergy subsidiaries and affiliates provide a wide range of energy and energy-related products and services, including the generation and sale of electricity; exploration and production of oil and natural gas; transmission and marketing of natural gas; mechanical and electrical contracting and construction; and energy management.

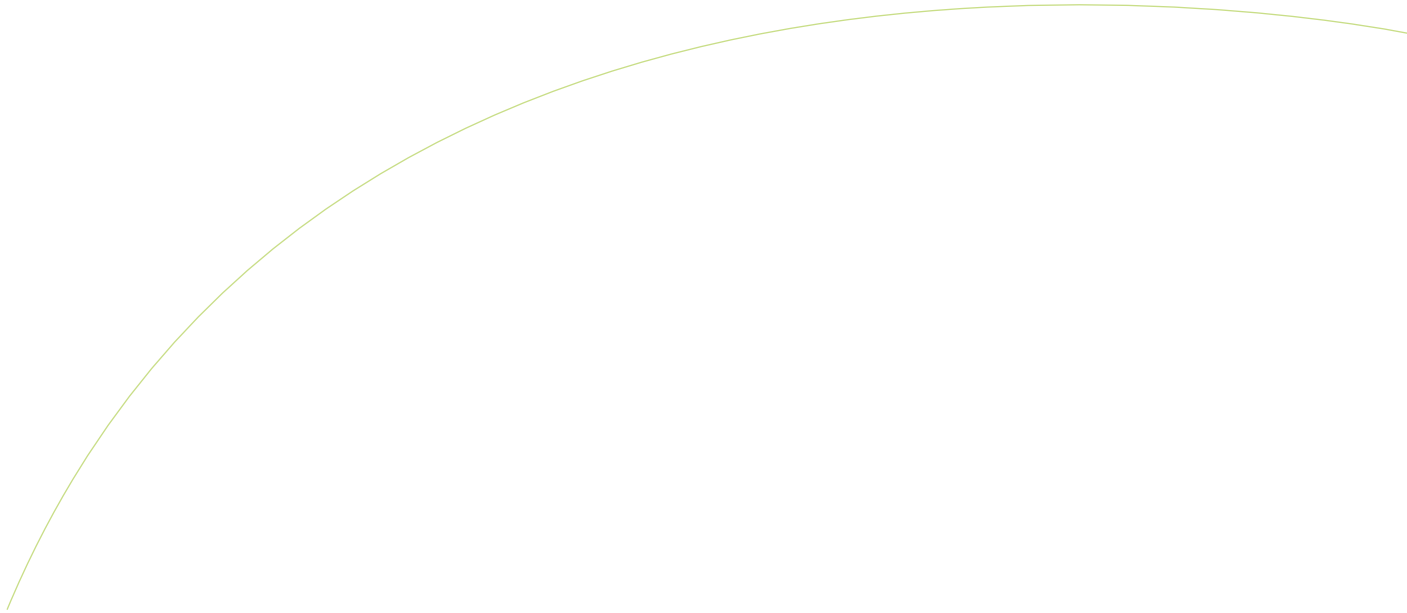
BETA Lab serves the needs of FirstEnergy's generating plants in addition to providing specialized expertise to companies in a variety of industries.

WHERE TO FIND US

BETA Laboratory is a state-of-the-art testing facility located just outside of Cleveland, Ohio, in Mayfield Village. To stop in with a sample or to take a tour of the lab, look for us east of I-271 (Exit 36) and north of Wilson Mills Road at 6670 Beta Dr.

For more information on how BETA Lab can help your company increase its competitive edge, call us toll-free at 1-800-470-BETA (2382), or visit our Web site, www.beta-lab.com.





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